Confirmation of Previous Analyses of the Tamiami Trail Next Steps Final EIS, Addressing Modifications to the Authorized Plan, Based on Recommendations from a 2019 Phase 2 Value Analysis Workshop

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March 31, 2020

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1. Executive Summary

In 2015, the National Park Service, Florida Department of Transportation, and the Federal Highway Administration began collaborating on the Tamiami Trail Next Steps (TTNS) Project, to construct bridges and reconstruct/raise the remaining unbridged roadway. When complete, this project will improve water conveyance, marsh connectivity, and sheetflow between Water Conservation Area 3A/3B and the Northeast Shark River Slough (SRS) of Everglades National Park (ENP). Phase 1 of the project was completed in April 2019, and includes 2.3-miles of western bridging, in addition to the previously constructed 1-mile eastern bridge completed during the Modified Water Deliveries (MWD) Project. The NPS sponsored two inter-agency Value Analysis (VA) workshops in July 2018 and October 2019, to develop an environmentally responsible and cost effective Phase 2 plan, to achieve the original project objectives.

The 2018 VA workshop reevaluated the original hydrologic benefits for the Tamiami Trail Next Steps Project, and determined that the existing 3.3 miles of bridging (MWD and TTNS Phase 1) represents an optimal bridging plan, and provides sufficient water conveyance capacity to pass future Comprehensive Everglades Restoration Plan (CERP) flows. The Phase 2 plan will therefore focus on reconstructing/raising the remaining 6.7-miles of roadway, which constrains water levels in the adjacent L-29 Canal, limiting future restoration benefits in both the upstream Water Conservation Areas and ENP. The 2018 VA workshop recommend a Phase 2 modified plan, with no additional large bridges beyond the existing 3.3-miles of bridges, adding six 72-foot wide pre-cast concrete culverts, reconstructing/raising the roadway, and adding swales for water quality treatment. This modified plan scored higher for reconnecting historic sloughs, and achieved the original project objectives for unconstrained water flows, marsh connectivity, restoring sheetflow, and recreating marsh flow velocities, given the expected limitations of removing less of the upstream L-29 Levee, as described in the Army Corps of Engineers, Central Everglades Planning Project (CEPP) 2016 authorized plan.

The October 2019 VA workshop recommended several additional modifications to the Phase 2 plan: replacing the six proposed 72-foot wide culverts with 60-foot wide slab bridges, enlarging the swale system treatment capacity by 50% to meet the Outstanding Florida Water (OFW) designation for ENP, adding four turning lanes to improve traffic safety at the Coopertown and Gator Park commercial sites, the Airboat Association, and the Miccosukee Osceola Camp, and adding a new access lane, diagonal parking, retaining walls, and wider shoulders for improved safety at the Miccosukee Tigertail Camp. This second Phase 2 Confirmation of Previous Analyses (CAP) report summarizes these recommended changes and compares their benefits and impacts to the Original Plan recommended in the 2010 Final EIS. The general conclusion from this 2020 Confirmation of Previous Analyses is that the Phase 2 modified plan will meet the purpose and need of the TTNS project and result in improvements to the natural resource conditions within Everglades National Park that are generally consistent with the Original Plan (Alt. 6e in the 2010 Final EIS).

The Phase 2 modified plan would have a projected 4.63 additional acres of permanent wetland impacts compared to the 2010 Original Plan. There would be no temporary wetland impacts compared to 22.4 acres in the Original Plan, by constraining all construction activities within the

new roadway and swale footprint. This slight increase in permanent wetland impacts is the result of enlarging the stormwater treatment system, to address the OFW treatment requirement for water entering ENP. This design refinement will decrease runoff and the associated nutrients and pollutants from the roadway, improving water quality and reducing wetland habitat alterations along the northern boundary of Everglades National Park.

Eighteen threatened and endangered (T&E) species were evaluated in this analysis, with eleven that were newly listed and/or not evaluated in the 2010 Final EIS. Only two of these previously evaluated species, the Wood stork (*Mycteria Americana*) and the Florida panther (*Puma concolor coryi*) had Likely to Adversely Affect determinations. Since the wetland impacts under the Phase 2 modified plan are only slightly larger than the Original Plan, losses to T&E species habitat would be minimal, and this did not change the effect determinations. The cultural resource impacts to the Tamiami Trail roadway under the Phase 2 modified plan would be less than the Original Plan, since 2.8-miles of additional bridging would not occur. There would still be no direct impacts to historic structures, but adjacent entrance roads and parking areas on historic properties would be reconstructed to match the elevation of the raised roadway.

Life Cycle Costing analysis in the 2018 Confirmation of Previous Analyses determined that replacing 2.8-miles of additional bridging with six larger culverts (or slab bridges), as well as the other recommended modifications, lowers the total project cost by more than $118 million, while achieving 78% of the benefits (maximum importance value). The Phase 2 modified plan includes roadway improvements that will increase driver safety such as widening the roadway shoulders, adding four turning lanes, and the new access lane, barrier walls, and diagonal parking at the Miccosukee Tigertail Camp. The reconstructed roadway in the Phase 2 modified plan will improve roadway stability throughout its 100-year lifespan, can better withstand high water events, and the impacts of climate change. The Phase 2 project ensures a higher quality of life for rural and tribal communities, by providing long-term reliable access to economically and culturally important sites.

2. Need for this Confirmation of Previous Analyses

This is the second Phase 2 Confirmation of the Previous Analyses that compares recommended modified features and their impacts with those included in the 2010 Final Environmental Impact Statement (EIS) for the Tamiami Trail Next Steps Project (TTNS project). The 2010 Final EIS recommended up to 5.5-miles of new bridging and reconstructing (raising and widening) the remaining roadway to improve water conveyance, marsh connectivity, and sheetflow into Northeast Shark River Slough (SRS). The TTNS Phase 1 project included 2.3-miles of new bridging and adjacent approaches/transitions, which were completed in April 2019.

During Phase 1 construction the NPS began a detailed analysis of the remaining roadway improvements that would be needed in Phase 2 to achieve the TTNS project objectives. The first Phase 2 re-analysis was described in a December 2018 Confirmation of Previous Analyses report, reflected recommendations from an NPS sponsored interagency Value Analysis (VA)

workshop held in July 2018. That report focused on two key modifications to the original conceptual design included in the 2010 Final EIS: (1) three previously recommended larger bridges (of 0.38 miles, 0.66 miles and 1.77 miles), would be replaced with six 72-foot wide pre-cast culverts, and the remaining culverts would be replaced in-kind, and (2) a new system of swales along the south side of the roadway were be added to address stormwater drainage and water quality treatment required by the State of Florida (FDOT and FDEP).

This current Phase 2 Confirmation of Previous Analyses focuses on two additional changes to the roadway typical section that were similarly recommended in a second NPS sponsored VA workshop in October 2019: (1) enlargement of the proposed swale system to address the requirements for protecting Outstanding Florida Waters (OFW) within Everglades National Park, and (2) roadway variations to improve vehicle access and safety at two commercial airboat operations and two tribal residential areas located along the roadway. The Phase 2 recommendations for improved access and safety (expanding the roadway to accommodate left turn lanes) are very similar to elements described in the preferred and other alternatives that were analyzed in detail in the 2010 Final EIS. While the inclusion of swales for stormwater drainage and water quality treatment were not evaluated in the 2010 FEIS conceptual design, water quality detention ponds were previously evaluated in a 2015 TTNS Confirmation of Previous Analyses Report, and subsequently constructed to treat runoff from the TTNS Phase 1 bridges. A detailed assessment of the proposed swales was not possible in the 2010 FEIS, because the sizing of these features requires a greater level of roadway design detail. They are now included in the TTNS Phase 2, 60% design documents completed in late February 2020. This March 2020 Confirmation of Previous Analyses Report will demonstrate that the completed TTNS Phase 1 and recommended Phase 2 components will meet the project purpose, need, and objectives from the 2010 Final EIS, and have similar benefits and impacts to the Original Plan.

For reference purposes, the recommended plan in the 2010 Final EIS is referred to as the Original Plan. Modifications from a prior 2014 re-analysis and its associated Memo To File (from a December 2013 VA workshop), are referred as the First Modified Alternative. Modifications from a prior 2015 re-analysis and its associated Memo to File (reflecting the new water quality requirements by the Florida DEP) are referred as the Second Modified Alternative. The modifications from in the 2018 re-analysis and its associated Memo To File (from the July 2018 Value Analysis workshop) are referred as the Third Modified Alternative. This latest re-analysis and its associated Memo to File (from the October 2019 Value Analysis workshop) will be referred as the Fourth Modified Alternative.

Background

The Tamiami Trail Next Steps Project

Tamiami Trail is a 264-mile historic roadway completed in 1928, extending from Tampa to Miami. The eastern portion of this roadway has long been considered an obstruction to water flow through the Everglades. The 2009 Omnibus Appropriations Act directed the US Army Corps of Engineers (USACE) to immediately construct the features in a 2008 Modified Water Deliveries to ENP, Tamiami Trail: Limited Reevaluation Report, including a 1-mile eastern

bridge and partially raising the remaining roadway to accommodate an L-29 Canal design high water of 8.5 feet (NGVD). The 2009 Act directed the NPS to evaluate bridging alternatives for the full 10.7-mile eastern section of the Tamiami Trail (US Highway 41) roadway, beyond what was authorized by the USACE 2008 Modified Water Deliveries to ENP, Tamiami Trail: Limited Reevaluation Report (LRR), in order to "restore more natural water flow to Everglades National Park and Florida Bay and for the purpose of restoring habitat within the Park and the ecological connectivity between the Park and the Water Conservation Areas."

The Final EIS for the TTNS project was completed in October 2010, and a Record of Decision (ROD) was published in April, 2011. Six Alternatives with various bridging and roadway reconstruction options were evaluated. The recommended Alternative (6e), included 5.5-miles of additional bridging (for a total of 6.5-miles of bridging), and reconstructing/raising the remaining roadway to accommodate an L-29 Canal design high water (DHW) of 9.7 feet NGVD. This would achieve the 2009 Omnibus Appropriation Act's restoration objectives and be fully consistent with the flow requirements in the Comprehensive Everglades Restoration Plan (CERP).

Tamiami Trail Next Steps Phase 1

In December 2011, Congress passed the Consolidated Appropriations Act of 2012 (Public Law 112-74) authorizing construction of Alternative 6e of the TTNS project. In October 2012, the NPS directed staff at the NPS Denver Service Center (DSC) and Everglades National Park to begin Phase 1 implementation. Phase 1 of the Original Plan (Alt. 6e) included the western 2.6-mile bridge and adjacent roadway approaches (Figure 1). In early 2013 the NPS developed a conceptual design and initial cost estimate of $180 million for Phase 1, to construct 2.6-miles of

Figure 1. The Next Steps recommended plan (6e), with the Phase 1 study area (red box), which includes the Original Plan's western 2.6-mile bridge and associated approaches.

bridging and roadway improvements adjacent to Everglades Safari Park. In late 2013, the State of Florida pledged up to $90 million in Florida Department of Transportation (FDOT) funding,

and the NPS and Federal Highway Administration (FHWA) committed to matching that funding up to $90M.

The NPS submitted a preliminary engineering design to the FDOT in October 2014. The FDOT would manage project construction, and a Memorandum of Agreement (MOA) between the FDOT, the NPS, and the FHWA was signed in early 2015. The FDOT advertised a design/build project in June 2015. FDOT issued a construction contract to Condotte America for $97 million in June 2016, and a notice to proceed in August 2016. The Tamiami Trail Next Steps Phase 1 project area extended just over 3 miles. The First Modified Alternative replaced the 2.6-mile bridge with two shorter bridges and a transition road. This reduced the wetland impacts, while improving access to Everglades Safari Park. The Phase 1 eastern bridge (with 0.88-miles of decking) was completed in April 2018, and the western bridge (with 1.43-miles of decking) was completed in October 2018. Associated roadway reconstruction covered 0.71-miles, including the western/eastern bridge approaches and the bridge transitions at Everglades Safari Park. The new roadway sections were raised from approx. 10.0-10.5 feet to 13.1 feet (NGVD), to accommodate the future CERP design high water requirement of 9.7 feet in the adjacent L-29 Canal. Removal of the abandoned Tamiami Trail roadway in front of the bridges began in October 2018, and the remaining Phase 1 construction was completed by April 2019 (Figure 2).

Changing Design Considerations for TTNS Phase 2 Implementation

The original bridging and roadway design in the TTNS 2010 Final EIS was based on water conveyance, marsh connectivity, and sheetflow enhancement features included in the 2000 Comprehensive Everglades Restoration Plan (CERP) Final EIS. These Decompartmentalization and Sheetflow Enhancement (Decomp) project features were expansive, including removal of the

Figure 2. The Next Steps Phase 1 project, as constructed. Two bridges totaling 2.3-miles replaced the Original Plan's western 2.6-mile bridge.

lower 7-miles of the L-67A and L-67C levees, backfilling their adjacent canals, and removing the full 10.7-miles of the L-29 Levee north of Tamiami Trail adjacent to WCA-3B, and backfilling the adjacent L-29 Canal.

The 2016 Water Resources Development Act authorized the Central Everglades Planning Project (CEPP) a key component of the CERP. Unlike the 2000 CERP conceptual approach, the authorized 2016 CEPP plan was more constrained, replacing the L-67A Levee removal with three gated water control structures, removing a much smaller portion of the L-67C levee and Canal replacing this with a new L-67D Levee, and reducing the 10.7-mile L-29 Levee removal to the ~3-mile reach directly aligned with the TTNS Phase 1 bridging (Figure 3).

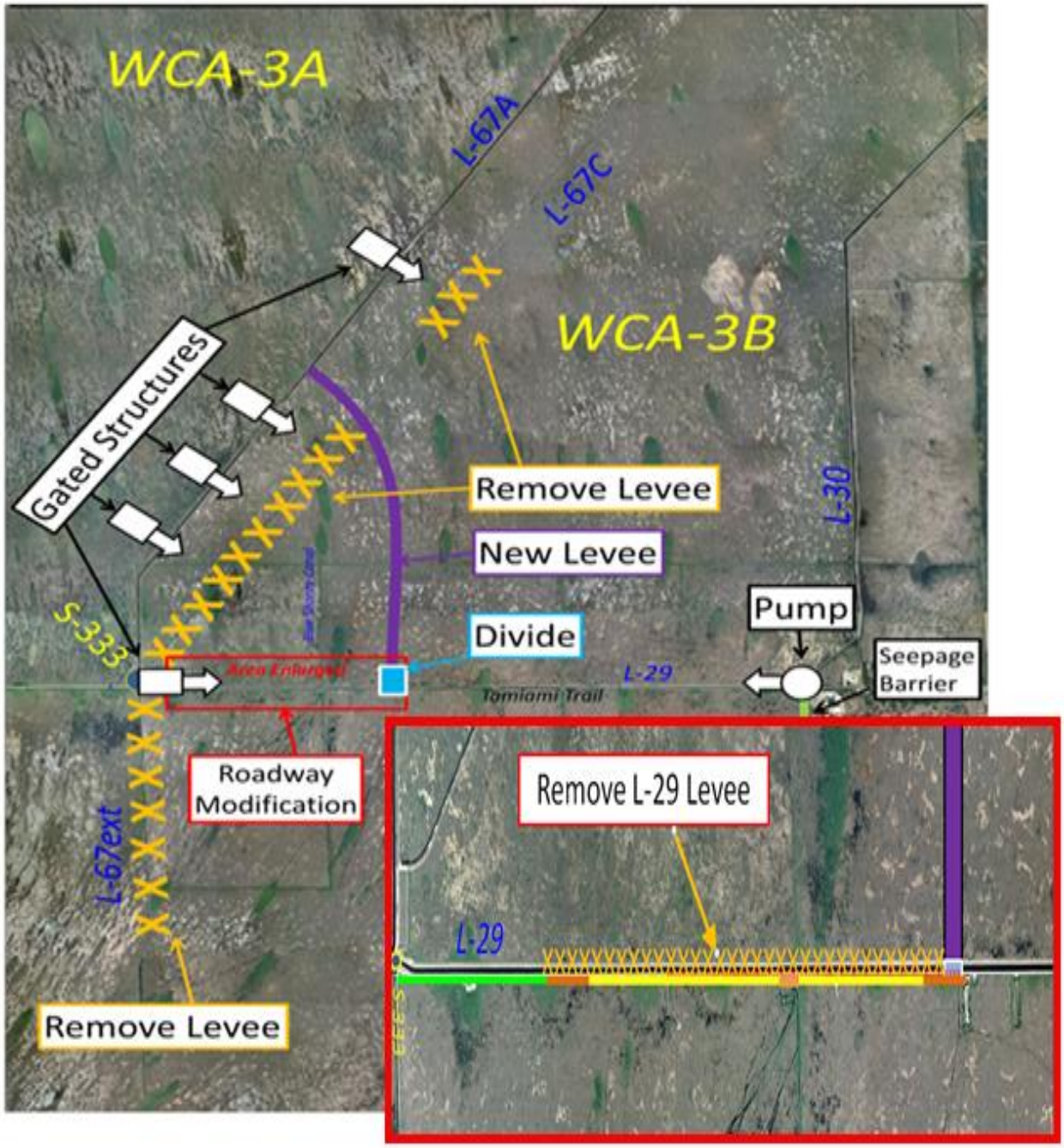


Figure 3. Conceptual components of the Central Everglades Planning Project. The inset map shows the alignment of the Tamiami Trail Next Steps Phase 1 bridging, with the proposed the L-29 Levee removal.

This change triggered the need to reevaluate the TTNS Phase 2 project components. This reevaluation of the future bridging and roadway improvements occurred during the July 2018 interagency Value Analysis workshop, described in detail in the December 2018 Confirmation of Previous Analyses Report. The 2018 VA workshop recommended a Phase 2 alternative, with no additional large-scale bridges beyond the existing 3.3-miles, adding six 72-foot wide pre-cast concrete culverts, reconstructing the remaining ~6.5 miles of roadway, and adding swales for stormwater detention and water quality treatment. This alternative scored higher for reconnecting historic sloughs, and achieved the original project objectives for unconstrained water flows, marsh connectivity, restoring sheetflow, and recreating marsh flow velocities, given the limitations of removing less of the upstream L-29 Levee, as proposed in the USACE Central Everglades Planning Project (CEPP) authorized plan.

While this recommended CEPP design works well with the TTNS Phase 1 western bridging and roadway improvements, the planned reductions in levee removal and canal backfilling in the upstream WCAs negate the benefits of additional Tamiami Trail large-scale bridging. These changes will therefore impact the NPS efforts to achieve the broader sheetflow and marsh connectivity envisioned in the 2009 Omnibus Appropriations Act (i.e. the hydrologic and ecological benefits of additional Tamiami Trail bridging are linked to the extent of upstream levee removal).

3. Documents and Legislation Pertinent to Confirmation of Previous Analyses

This fourth re-evaluation of the TTNS project builds on the Congressional Directives and prior analyses and actions that have been undertaken by both the National Park Service and the U.S. Army Corps of Engineers. These include a series of legislative actions, planning studies, land acquisition, and ecosystem restoration projects in the southeastern Everglades:

- *1989 Everglades National Park Protection and Expansion Act (Public Law 101-229).*
- *Land Protection Plan Environmental Assessment, East Everglades Addition, NPS/Everglades National Park (1991.)*
- *Army Corps Final Revised General Reevaluation Report/Second Supplemental Environmental Impact Statement (RGRR/SEIS): Tamiami Trail Modifications, Modified Water Deliveries to ENP Project (2005).*
- *Army Corps Modified Water Deliveries to Everglades National Park Tamiami Trail Modifications Final Limited Reevaluation Report and Environmental Assess. (2008).*
- *2009 Omnibus Appropriations Act (March 10, 2009).*
- *Tamiami Trail Modifications: Next Steps, Final Environmental Impact Statement, National Park Service, October 2010.*
- *2012 Consolidated Appropriations Act (Public Law 112-74).*
- *Memo to File and Supplemental Assessment for Lincoln Financial Media and Salem Communications Radio Tower Facilities Located in the East Everglades Expansion Area of Everglades National Park (June 2012).*
- *Final General Management Plan / East Everglades Wilderness Study / Environmental Impact Statement for Everglades National Park (August 2015).*
- *Value Analysis Final Report for 2.6-Mile Tamiami Trail Bridge, NPS (December 2013).*

- *Memo To File and Supplemental Assessment based on the Recommendations of the Value Analysis Workshop, 2.6-Mile Tamiami Trail Bridge, NPS (May 2014).*
- *Memo to File and Supplemental Assessment based on Regulatory Requirements of the Florida Department of Environmental Protection, Tamiami Trail Next Steps Project, NPS (March 2015).*
- *Value Analysis Final Report, Tamiami Trail: Next Steps Phase 2, Roadway and Conveyance Improvements, NPS (September 2018).*
- *Memo to File and Confirmation of Previous Analyses based on the Recommendations of the July 2018 Value Analysis Workshop Final Report (December 2018).*
- *Value Analysis Final Report, Tamiami Trail: Next Steps Phase 2, NPS (December 2019).*

4. 2019 Value Analysis Recommended Modifications and Consistency with Alternatives Evaluated in the 2010 Final EIS

Bridging/Conveyance Modifications

The impacts and benefits of TTNS project (Original Plan) were initially based on constructing 2.8-miles of additional bridging. The effect of replacing the larger bridges with smaller concrete pre-cast culverts or bridges was initially examined as part of the Modified Water Deliveries project by the USACE (USACE, 2008). Their findings were reviewed in the 2018 Confirmation of Previous Analyses (2018 CPA) resulting from the Value Analysis performed in July 2018. These effects determinations were then compared to the Original Plan. Replacing the larger bridges with smaller but more numerous culverts or slab bridges is considered appropriate, since the USACE Central Everglades Planning Project (CEPP) authorized plan will be removing no additional portions of the upstream L-29 Levee, outside of the TTNS Phase 1 bridging. This smaller but more distributed bridging approach scored higher than the Original Plan for reconnecting historic sloughs, and achieved the project objectives for unconstrained water flows, marsh connectivity, restoring sheetflow, and recreating marsh flow velocities. Further design refinements were made in a Value Analysis performed in October of 2019 (2020 Design). This document evaluates the impacts of these new design changes to the project and compares the effects to the two earlier analyses.

Replacement of Culverts:

Current Design:

Historically there were 19 culvert sets that passed water into Everglades National Park from the L-29 canal in the stretch of Tamiami Trail between water control structures S-333 and S-334. Five of these culverts were removed/plugged when the three larger bridges and their approaches were built in the earlier phases of the reconstruction of the road, however 14 culverts remain. Six will be replaced with 60-foot-long flat slab bridges and 7 will be replaced ‘in kind’ with larger diameter culverts as part of the Phase 2 reconstruction of Tamiami Trail (Figure 4). The last culvert is in the remaining access road to the Entercom radio tower (located in front of the

western-most bridge), and this culvert will be removed along with the roadway, after the Entercom reserved use agreement expires.

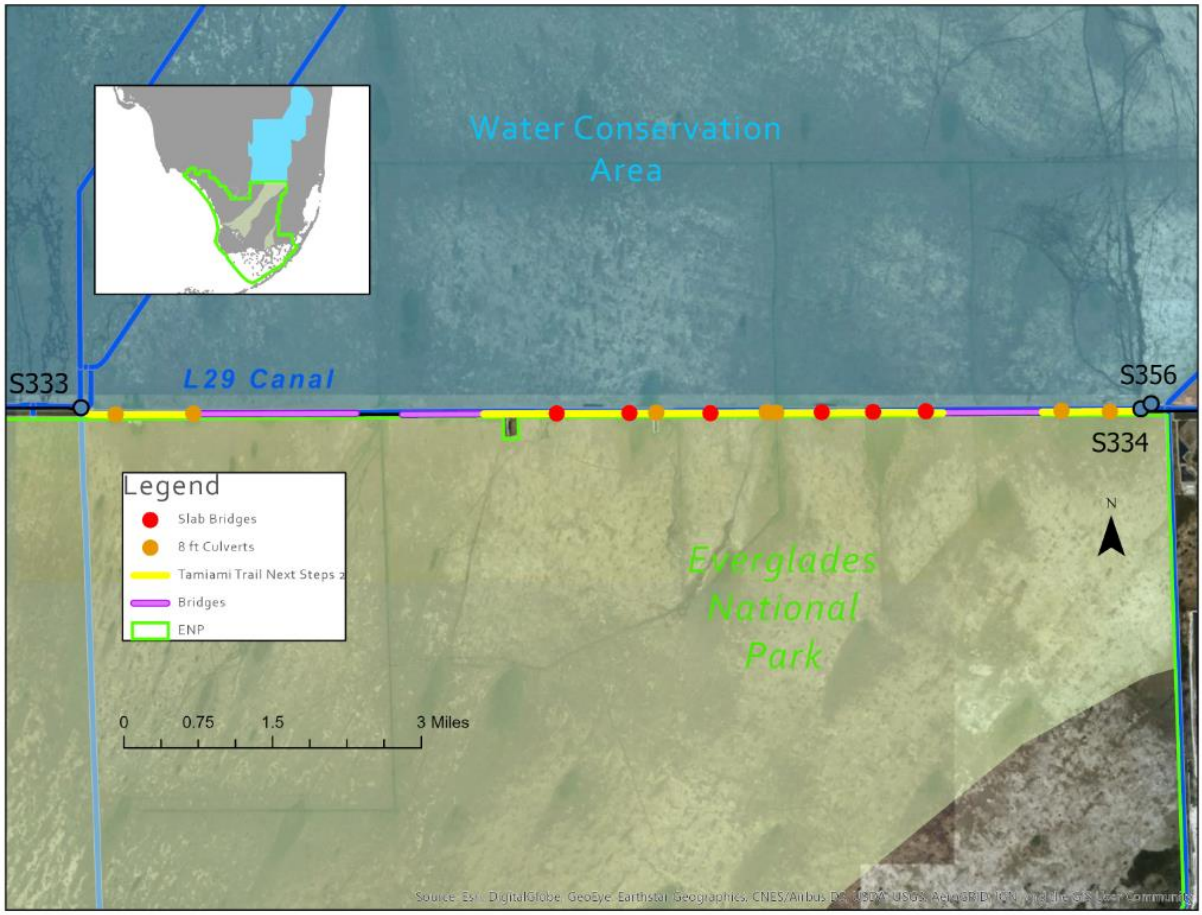


Figure 4. Location of six culverts to be replaced with slab bridges (red) and seven culverts to be replaced 'in kind' with 8-foot diameter culverts (yellow).

Culverts number 48, 49, 51, 54, 55, and 56 will be replaced by Slab Bridges (Figure 5). This bridge type was selected during the VA because it is better for wildlife crossing under the highway due to the natural bottom and sloped sides. This type of bridge also has minimal required routine maintenance and repair necessary than the other alternatives that were explored. This bridge type is easier to construct and creates less of an environmental impact, dewatering is not necessary and there is no concrete foundation. This type of bridge also has less of a footprint than other types of small bridges, and fewer pilings are necessary.

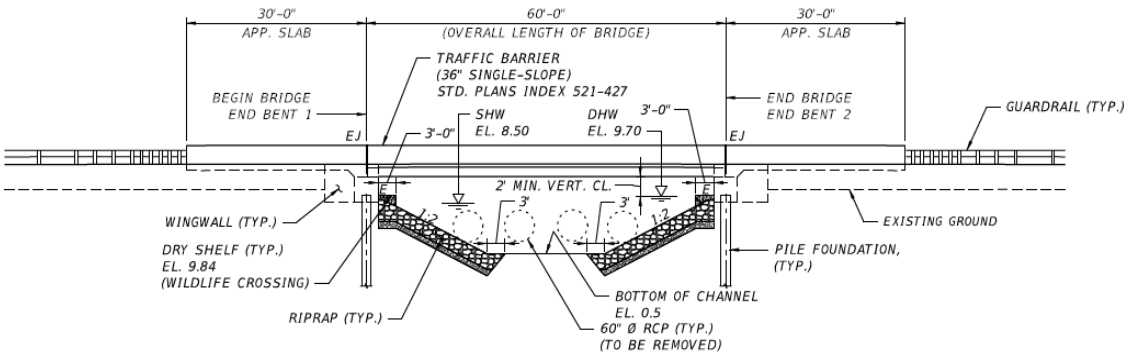


Figure 5. Typical Slab bridge layout.

The culverts to be replaced with bridges were selected for several reasons. The bridges were placed in the central portion of the project area, away from the large bridges that have already been constructed. They were placed in locations where it may be possible to reestablish historic sloughs that were found at these locations prior to the construction of Tamiami Trail. Finally, the slab bridges were not placed to the east of the one-mile bridge, where seepage losses from the eastern Northeast SRS marshes into the L-31N canal is already a problem.

Culvert sets 41, 42, 50, 52, 53, 58, and 59 will be replaced 'in kind' with minimum 8-foot diameter culverts. These culverts are currently between 3.5 - 5 ft in diameter with a variable number of culverts (depending on location) (Table 1). Replacing the current culverts with similar size pipes would require grates placed on the up and downstream ends to prevent manatees from becoming entrapped in the culvert. However, other wildlife such as turtles and alligators would be prevented by the grates from using the culverts to cross under the Tamiami Trail. Replacing the culverts with 8 ft culverts would eliminate the necessity of having manatee grates and would be a benefit to wildlife who would continue to access the L29 Canal/ENP without having to cross the roadway.

Table 1. Current and replacement culvert specifications. Replacements are assumed to be 8 ft in diameter.

Culvert No	# of Barrels	Diameter of Barrels (ft)	# Barrels in Replacement
41	3	4.5	1
42	3	5	2
50	3	5	2
52	1	5	1
53	3	5	2
58	3	3.5	1
59	3	4	1

Culvert cross sectional areas will generally be increased from what exists currently, some culverts will have similar cross-sectional area, while several will increase significantly. For example, at culvert 53, there are currently 3 5-foot culverts, which have a total area of 58.9 sq ft. One 8-foot barrel culvert has an area of 50.26 feet. Using only 1 culvert would reduce the flow capacity at that culvert, so 2 8-foot culverts will be added in that location, resulting in a total of 100.5 sq ft.

Culverts 43, 45, and 47 will not be replaced. Culvert 45 located near Everglades Safari Park will not be replaced because it was lengthened during phase 1 of the TTNS project. Replacing the culvert would require removing the newly replaced road (2018) which would be expensive and disruptive for minimal or no benefit. The second culvert, 45 is located in the portion of Tamiami Trail that was left under the western bridge to allow access to the Lincoln Financial Radio Towers. The road under the bridge will be removed when the lease ends in 2036. Replacing the culvert would be expensive and of minimum benefit due to the proximity of the flowing area under the bridge and the short time before the remaining access road will be removed. Culvert 47 was blocked as part of the TTNS Phase 1 project. It was determined that because of the additional 25 feet of bridge span added to the conceptual design, the flow from the additional length of bridge would compensate for any loss as a result of plugging this culvert.

Changes from the 2018 Confirmation of Previous Analyses:

The design analyzed in the 2018 Confirmation of Previous Analyses proposed six 72-foot wide pre-cast concrete culverts at six existing culvert locations and replacing the remaining culverts in kind.

- The precast culverts have been replaced in the new plan by slab bridges. These bridges are not significantly different than the proposed precast culverts but will cause less impacts as a result of reducing the pilings necessary to support the bridges.
- The culverts at the remaining locations will be replaced with larger culverts. This replacement is being done to eliminate the need for manatee grates and reduce the impact to other wildlife.

Changes from EIS:

The selected alternative in the 2010 Final EIS was alternative 6e. This alternative proposed adding an additional 5.5 miles of bridging (three bridges: 0.38 miles, 0.66 miles and 1.77 miles).

Roadway Modifications:

Existing Condition and 2020 Design:

From a design perspective, the overall goal of the roadway reconstruction effort is to remove the existing unsuitable sub-base, raise the top of the finished roadway elevation to approximately 13.13 feet (NGVD), and add features for water quality treatment. The current typical section consists of a 2-lane undivided highway with 12-foot travel lanes and 10-foot outside paved and sodded shoulders on both sides of the roadway. The new typical section will be raised several feet and shifted southward of the existing alignment. The typical section will remain as a 2-lane

undivided highway with 12-foot travel lanes, but will be modified to include 12-foot shoulders. All travel lanes and shoulders will be sloped to the south, away from the L-29 canal. Dry detention swales will be added on the south side of the roadway for stormwater management. Six of the existing culvert sets will be replaced by 60-foot wide slab bridges, and the remaining culverts will be replaced with at least 8-foot diameter culverts to eliminate the need for Manatee exclusion grates. These changes to the design are a result of the 2018 and 2019 VAs, and are intended to improve the water quality of stormwater runoff, to meet FDEP standards. The roadway shoulder widening will meet FDOT standards for highway safety. The larger slab bridges will have natural marsh bottoms to decrease wildlife mortality by increasing the accessibility and usability of these hydrologic features as wildlife corridors. The new 2019 VA design increases the size of the stormwater retention swales by 50%, to meet the 'Outstanding Florida Water' (OFW) standards for Everglades National Park (see figure 6 for design details).

Site specific modifications to the typical section include a new access lane and diagonal parking provided at the Miccosukee Tigertail Camp to increase tribal member safety and eliminate the necessity of parallel parking along Tamiami Trail. Left turn lanes will be added at the Miccosukee Osceola Camp, the Airboat Association, Coopertown, and Gator Park. Finally, billboards advertising the 3 airboat concessions and 2 Miccosukee tribal businesses will be moved south outside of the construction zone. The Airboat concessions will be limited to 2 billboards.

Stormwater Treatment

Existing Condition and 2020 Design:

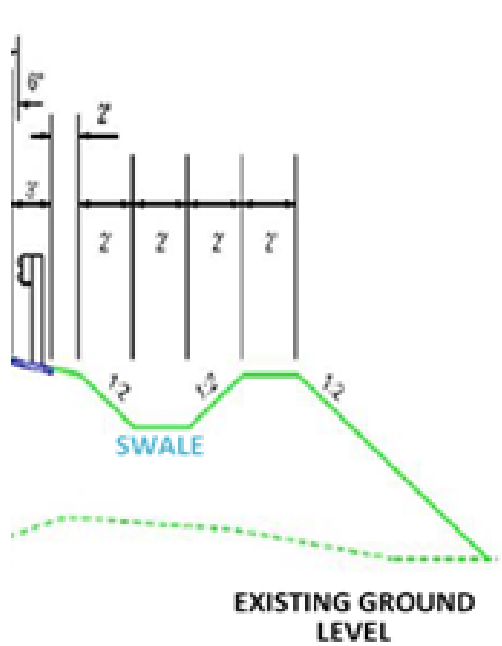
Presently there is no existing stormwater retention or treatment system for the conveyance and disposal of stormwater runoff from the roadway in the Tamiami Trail Next Steps Phase 2 project area. The existing roadway is crowned, and the stormwater runoff sheet flows off both sides of the road. The runoff discharges without control and treatment into the L-29 Borrow Canal along the north side of the road and into the ENP wetlands along the south side of the road.

Everglades National Park is an Outstanding Florida Water (OFW). According to stormwater quality procedures and guidelines set forth by the FDEP, projects discharging directly to an OFW must provide an additional 50% water quality pre-treatment volume as part of the required retention/detention. No degradation of water quality is to be permitted in an OFW.

As part of the TTNS Phase 2 project, a new stormwater management system has been designed to collect stormwater runoff generated by the proposed roadway. This runoff will be captured at the roadside by dry detention swales with exfiltration trenches prior to infiltrating into the groundwater (Figure 4). Miami-Dade County DERM has established an average October groundwater level for this area of 7.50 feet (NGVD). The project control water elevation (CWE) or average high water was established at 8.70 feet (NGVD), or 1.2 feet above the average wet season (October) water level. This CWE will be used to set the bottom elevation of the dry

detention swales. The swales are designed to detain peak discharges up to the 25-year, 72-hour storm. To maintain water quality criteria and prevent overtopping or erosion of the swale banks in the case of a larger rainfall event, all the swales are designed to slope down gradient to a control structure and bleeding mechanism (Figure 7). There will be 37 control structures (overflow weirs) along the length of the project, to manage extreme event outflows from the swales into Everglades National Park.

Previous Typical Section (6a)



Current Typical Section (6b)

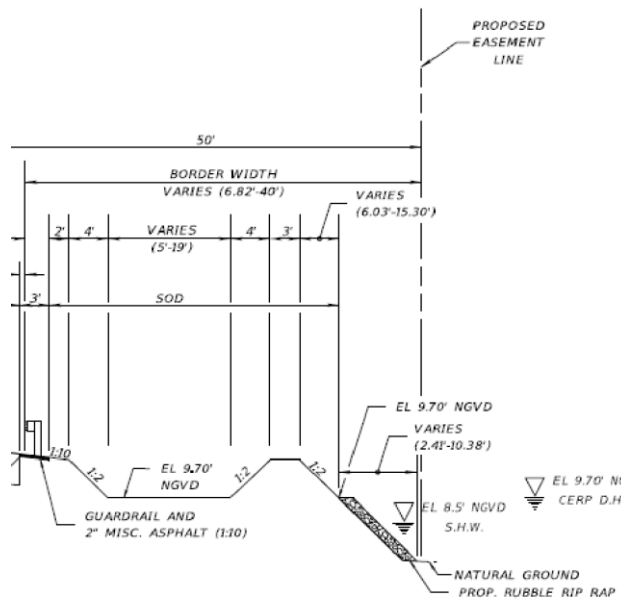


Figure 6. Comparison of swale design changes. Figure 6a. Shows the swale design evaluated in the 2018 Confirmation of Previous Analyses. Figure 6b. Shows the swale design currently proposed. The swales were enlarged by 50% to accommodate the increased treatment required for an Outstanding Florida Water (OFW).

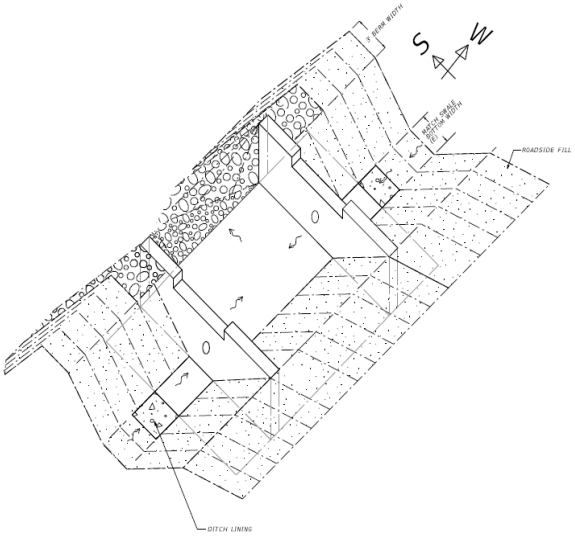


Figure 7. Design of overflow weirs. In extreme rainfall events, these weirs will discharge water from the swale system into Everglades National Park.

The area of swales in this phase of this project (8.84 ac-ft) exceeds the FDEP required treatment area for the post development condition (7.98 ac-ft) by 0.86 ac-ft. The swales will range in width from 5-19 feet wide depending on the location and surrounding land use (Figure 2b). They extend the length of the project, but are split into separate basins by the Osceola Camp, the Airboat Association, the two airboat concessions, the Salem Tower Road, and the 3 larger bridges. The sides of the swales will be 4-foot-wide and have a slope of 1:2. The interior and side slopes of the swale will be sodded and the top of the swale on the south side will be 3' wide to accommodate mowing. The southern slope into Everglades National Park will be 1:2 with rip-rap extending from the toe of slope to elevation 9.7ft NGVD. The riprap is intended to protect the slope from erosion.

The only conveyance system used in this project is at the Tigertail Camp parking area. Conveyance systems collect and carry stormwater runoff to receiving water bodies. The design of this storm sewer system will be based on FDOT drainage design criteria. Stormwater will be conveyed under the road through pipes, and into the swale system.

Changes from 2018 Confirmation of Previous Analyses:

The swale design from the 2018 VA was too small, it did not include the 50% additional required treatment for discharge to an OFW. As a result, the size of the swales has increased:

- This swale design is deeper and wider than was originally planned. It requires wider side slopes to maintain 1:2.
- The width of the bottom of the swale has increased, from 2 ft to 5-19 ft. The width of the top of the swale has increased from 2 feet to 3 feet.

- A 10 ft wide concrete weir will be added to the south wall of the swales approximately every 1000 ft for overflow to the south during major storm events. The weirs were added to prevent erosion of the swale banks due to uncontrolled overflow.
- Exfiltration trenches will be added every 500 feet to help reduce the area required for the dry swales.

Changes from EIS:

The 2010 Final EIS included stormwater treatment systems for the planned bridging components (scupper drains on the bridge decking connected to continuous deflective separation (CDS) units proposed along the roadway approaches). The Final EIS did not include stormwater treatment features along the raised roadway segments. The FDEP provided comments to the draft EIS in July 2010, and recommended development of stormwater treatment strategies, including the addition of swales and/or shallow wetland stormwater treatment areas to address runoff from the roadway/bridging impervious surfaces.

The Final EIS stated that "the reconstructed roadway will include a 6.5-foot grassed shoulder in addition to a 5 foot paved shoulder. While not tied to a formal numerical treatment standard, this measure is expected to provide more filtering for sediments and oils than exists today. Detention basins are not included in the project alternatives. Formal runoff treatment facilities could significantly increase the footprint and cost of the reconstructed roadway. Footprint increases could include wetland impacts that are counter to the ecological restoration goals of the project".

The NPS anticipated that additional stormwater treatment requirements would need to be addressed during the detailed design phase of the project. Stormwater treatment features (dry detention ponds replacing the planned CDS units) were added during the second modification to the TTNS Phase 1 bridging project (and were evaluated in the 2015 Confirmation of Previous Analyses and associated Memo To File). The TTNS Phase 2 project will include this proposed stormwater treatment system (swales with associated exfiltration trenches and overflow weirs) along the reconstructed roadway to meet the FDEP requirements for Outstanding Florida Waters. This change was incorporated into the 60% design documents. The stormwater swales represent the largest increase in wetland impacts (just under 9 acres) compared to the Original Project, and will be discussed in more detail in the wetlands section.

Turning Lanes Added on Tamiami Trail

Existing Condition and 2020 Design:

Tamiami Trail is a two-lane highway. East of the L-67E canal and west of the L-31N canal there are presently only turn lanes located at Everglades Safari Park and at the S334 structure. The turn lanes at Everglades Safari are a recent addition to the roadway and were added during Phase 1 of the TTNS project.

As a part of the TTNS Phase 2 project, four left turn lanes will be added to access the Airboat Association, Gator Park, Coopertown, and Osceola properties (see figure 1 for locations). These

lanes will be added to increase safety so drivers will no longer have to turn left from travel lanes. The inclusion of these turn lanes increases the road width by a maximum of 12 feet (Figure 8).

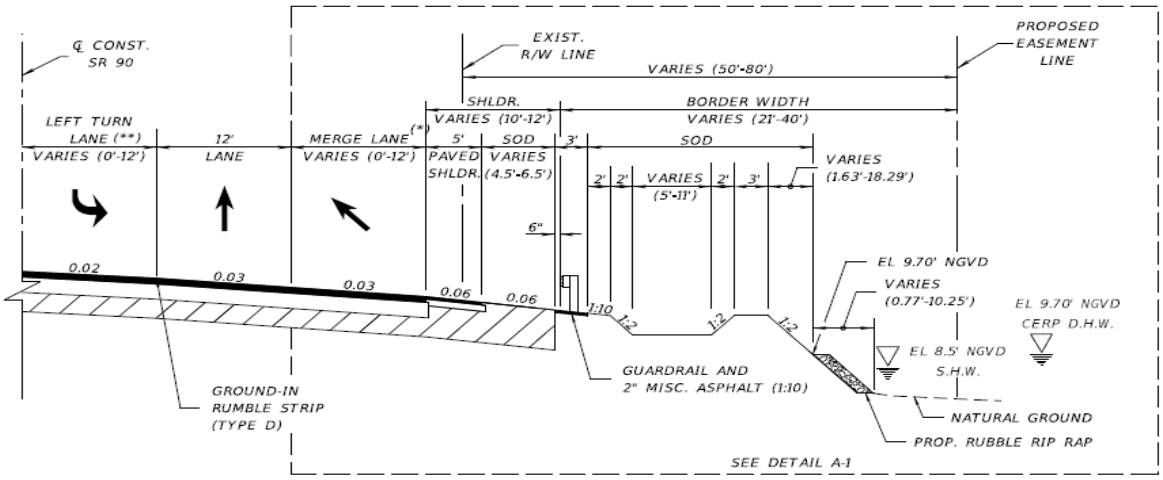


Figure 8. Typical section for Left Turn lanes at the Airboat Association, Gator Park, Coopertown, and Osceola properties.

Changes from 2018 Confirmation of Previous Analyses:

Turn lanes were considered in the 2018 VA workshop, but no additional lanes were analyzed in the 2018 Confirmation of Previous Analysis. Adding left turn lanes at Coopertown and Gator Park will further reduce the available parking at each business beyond what was expected from the road raising and widening.

Changes from EIS:

The EIS included acceleration and deceleration lanes for Everglades Safari Park and Coopertown in Alternatives 6B, 6C, 6D, and 6E. These lanes were part of down ramps that would allow drivers to access the two airboat properties from several different bridge alternatives. The new alignment with 12-foot turn lanes is expected to stay within the 50-foot easement that was evaluated as part of the EIS.

Tigertail Roadway Expansion

Existing Condition and 2020 Design:

The current parking for residents of the Miccosukee Tribe Tigertail Camp is on the paved shoulder of Tamiami Trail behind a guardrail. The available space only allows for parallel parking (Figure 9).

Figure 9. Current Parking at Miccosukee Tigertail Camp. The parking area is outlined in blue.

The Tamiami Trail Next Steps Phase 2 project will add 32 diagonal parking spaces for residents of the Tigertail Camp, which is approximately twice the existing number of spaces (Figure 10). The parking will be accessed via a dedicated service lane that will prevent blocked cars. The parking and access lane will be separated from Tamiami Trail by a concrete barrier wall.

Figure 10. Proposed diagonal parking and new access lane added at the Miccosukee Tigertail Camp.

Changes from 2018 Confirmation of Previous Analyses:

No parking alternatives for the Tigertail Camp were analyzed in the 2018 Confirmation of Previous Analysis.

Changes from EIS:

No parking alternatives for the Tigertail Camp were analyzed in the EIS. Expanding the roadway to include the dedicated access road and diagonal parking spaces will cause the roadway to expand a maximum of 80 feet to the south, 30 feet beyond the established 50-foot easement included in the EIS.

Coopertown

Existing Condition and 2020 Design:

The Coopertown Restaurant and Airboat Rides are located on the south side of Tamiami Trail within the project area. The business currently operates as a concessionaire for the National Park Service. Coopertown offers airboat rides, facilitates film production and magazine shoots, provides an onsite restaurant and giftshop, and has wildlife exhibits. Customers access the business through a large paved shoulder into the parking lot. An informal limestone fill employee and overflow parking lot exists west of the property. There are currently no left turn lanes into Coopertown, visitors must turn in from the west bound travel lane. The restaurant building was found to be potentially eligible for listing in the National Register of Historic Places (NRHP). The restaurant sits approximately 50 feet from the current roadway.

When the Tamiami Trail is raised, and widened, it will extend into the paved shoulder of this area. A left turn lane will also be added to access Coopertown and increase driver safety. These changes will result in the edge of the roadway (defined by a concrete barrier wall) being located approximately 14 feet from the front of the restaurant (Figure 11). The roadway expansion will also decrease the amount of existing parking available and limit the entrance area to one location. Lastly, the retaining wall and culvert extension will fill in a portion of the open water area west of the site, and rip-rap will be extended under the existing docks for slope stability. An ENP estimate found that a total of 29 parking spaces will be lost from the Coopertown lot as a result of this project. ENP is currently working with the business owners on a ‘Cures’ project, which is intended to raise the elevation of the buildings and parking lots to prepare for increased water levels that result from restoration. ENP will work with Coopertown through the Cures project to mitigate the parking area lost as a result of TTNS Phase 2. Expanded parking would be placed on previous existing filled areas and would have no additional wetland impact. ENP will complete appropriate NEPA, NHPA and ESA compliance for the Cures project prior to implementation.

Figure 11. Aerial photograph showing current conditions at Coopertown with the proposed design drawn overtop. The building outlined in purple is the restaurant.

Changes from 2018 Confirmation of Previous Analyses:

The design alternative analyzed in the 2018 Confirmation of Previous Analyses recognized that the roadway ROW would have to be expanded an unspecified distance to the south. This expansion would cause the loss of usable land areas around the historic properties due to the proximity to the project corridor.

- The inclusion of a left turn lane is the only change from 2018 Confirmation of Previous Analyses.

Changes from EIS:

Alternative 6e would have involved the construction of an elevated bridge across the front of the property requiring an access ramp that would consume approximately 40 percent of the parcel for the expanded right-of-way. It was determined in the EIS that *"Continued operation of the business probably would not be viable, and the National Park Service probably would acquire the entire parcel and raze and remove the buildings because adaptive reuse probably is not feasible, which would be a major impact."* The new roadway design that substitutes smaller slab bridges for the larger elevated bridge will maintain the viability of this business, once the cures are in place.

Osceola Camp

Existing Condition and 2020 Design:

The Osceola Camp is located on the south side of Tamiami Trail within the project boundary. The property has been found to be potentially eligible for listing in the NRHP. The road right of

way is currently approximately 60 feet in this area and is a mix of grass and limestone fill. Visitors use this area as informal parking for events inside the camp and as a school bus stop. There is currently a wooden stockade fence with a gated entrance. Camp members can also access the interior by driving west past the fence.

The Tamiami Trail widening in this section and a left turn lane will improve the safety of drivers turning into the Osceola Camp (Figure 12). The water quality treatment swales that run parallel to the new roadway and collect and treat runoff have been narrowed for approximately 380 feet east of the Osceola driveway to decrease the impact of the expanding roadway to the tribal area. However, these changes will still affect the camp members informal parking along Tamiami Trail and affect the primary entrance.

Figure 12. Roadway and swale alignment north of Osceola Camp

The NPS will work with the Osceola camp members to mitigate for the loss of parking in the FDOT right of way. Additionally, the elevation of many of the buildings and ground surface also needs to be increased to prevent the area from flooding as a result of water level increases from the Central Everglades Project (CEPP). The US Army Corps of Engineers (USACE) has prescribed elevations for the ground surface, non-residential buildings, and residential buildings. The NPS will work with the Miccosukee Tribe and the USACE to ensure the Camp meets the elevation requirements and the loss of parking is mitigated. ENP will complete appropriate NEPA, NHPA and ESA compliance for the site improvements and parking relocation prior to implementation. To provide the time needed to prepare this new site design, the roadway in front of the Osceola Camp (from MP 14.032 to MP 14.448) will be a no work zone for the TTNS Phase 2 project. Once the site design is finished and the visitor parking and bus stop requirements are achieved, the TTNS Phase 2 project will complete the roadway work and harmonize to this new site elevation.

Changes from 2018 Confirmation of Previous Analyses:

The design alternative analyzed in the 2018 Confirmation of Previous Analyses recognized that the roadway ROW would have to be expanded an unspecified distance to the south. The 2018 Confirmation of Previous Analyses also included swales in the typical section. The confirmation assessment concluded that *"The expansion would cause the loss of usable land areas around the historic properties due to the proximity to the project corridor."*

- The inclusion of a left turn lane is the only change from 2018 Confirmation of Previous Analyses.

Changes from EIS:

The EIS stated "*Increasing the roadway height would require additional ROW at the ground level or base of the embankment, resulting in loss of usable ground*" at Osceola Camp. The EIS reported a Minor Impact at Osceola Camp as a result of any of the action alternatives (Alt 1-6e). The roadway expansion would remain within the 50-foot easement included in the EIS.

Gator Park

Existing Condition and 2020 Design:

Gator Park is located on the south side of Tamiami Trail within the project boundary. The business currently operates as a concessionaire for the National Park Service. The Park provides airboat rides, wildlife shows, a restaurant, and a souvenir shop. Currently, patrons can enter along a broad paved shoulder that connects directly to the parking area. There are currently no left turn lanes into Gator Park, visitors must turn in from the west bound travel lane. The buildings sit more than 50 feet back from the roadway.

The roadway will be raised and widened in this section. A left turn lane will also be added to increase the safety of drivers turning into Gator Park. The property is further affected by the expansion of the roadway south to accommodate new parking at Tigertail Camp (Figure 13). A concrete barrier will be used at the edge of the roadway to eliminate the need to create a side slope on the southern edge of the road. These changes will affect the parking and entrance at Gator Park. The new roadway as designed extends approximately 20 feet into the current parking lot. There will be 26 parking spaces lost as part of the construction. The parking will be lost from the front of the buildings and the west side of the lot. Lastly, the retaining wall and culvert extension will fill in a portion of the open water area east of the site, and rip-rap will be extended under the existing docks for slope stability.

ENP is currently working with the business owners on a 'Cures' project, which is intended to raise the elevation of the buildings and parking lots to prepare for increased water levels that result from restoration. ENP would work with Gator Park through the Cures project to help mitigate the parking area lost as a result of TTNS Phase 2 project. Expanded parking would be placed on previous existing filled areas and would have no additional wetland impact. ENP will complete appropriate NEPA, NHPA and ESA compliance for the Cures project prior to implementation.

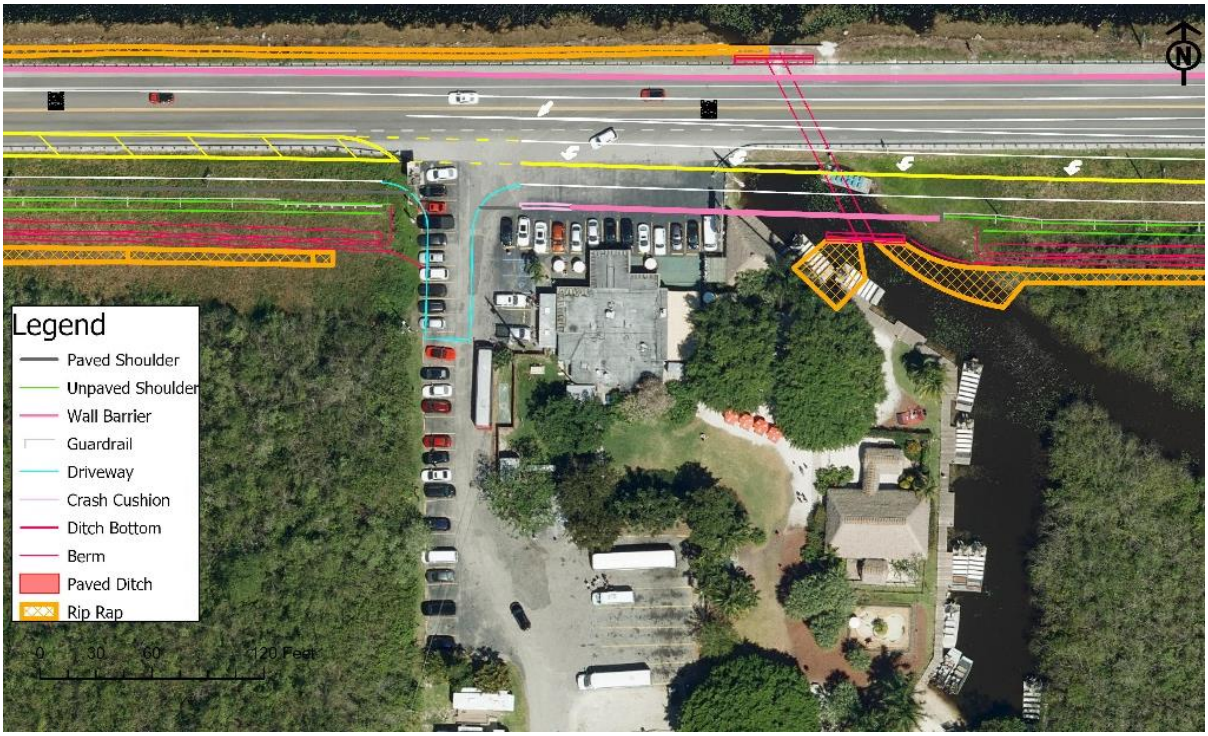


Figure 13. Proposed roadway changes as a result of TTNS Phase 2.

Changes from 2018 Confirmation of Previous Analyses:

The design alternative analyzed in the 2018 Confirmation of Previous Analyses recognized that the roadway ROW would have to be expanded an unspecified distance to the south.

- The inclusion of a left turn lane is the only change from 2018 Confirmation of Previous Analyses.

Changes from EIS:

The EIS states "Increasing the roadway height would require additional ROW at the ground level or base of the embankment, resulting in loss of usable ground". The EIS also recognizes that "Increasing the roadway height may also result in loss of property visibility, which is very important to commercial enterprises." The roadway expansion remains within the 50-foot easement included in the EIS.

Airboat Association

Current Design and Proposed Changes:

The Airboat Association is on the south side of Tamami Trail within the TTNS Phase 2 project boundary. Members can enter the property through a limestone fill driveway. A chain link fence is located approximately 30 feet south of the roadway. The Airboat Association was found to be potentially eligible for listing in the NRHP. Buildings are located approximately 150 feet from the roadway.

The road will be raised and widened in this section (Figure 14). A left turn lane will also be added in this location to increase the safety of drivers turning into the Airboat Association. Water treatment swales will run parallel to the new roadway, to collect and treat runoff from the roadway surface. Features associated with the roadway expansion will extend approximately 42 feet into the current right of way and impact a chain link fence and planted vegetation barrier on the property.

Figure 14. Aerial photo of Airboat Association with proposed roadway changes.

Changes from 2018 Confirmation of Previous Analyses:

The design alternative analyzed in the 2018 Confirmation of Previous Analyses recognized that the roadway ROW would have to be expanded an unspecified distance to the south. Water quality treatment swales were included in the typical section so were included in this determination. The analysis concluded "This expansion would cause the loss of usable land areas around the property due to the proximity to the project corridor." An analysis of the impacts to the historic status of the Airboat Association can be found in "Addendum: Tamiami Trail Modification: Next Steps, Everglades National Park." The addendum found that "No new effects will occur due to the change from bridges to culverts."

- The inclusion of a left turn lane is the only change from 2018 Confirmation of Previous Analyses.

Changes from EIS:

The Airboat Association of Florida was determined to not be adversely affected by Alternative 6e. The EIS states "Increasing the roadway height would require additional ROW at the ground level or base of the embankment, resulting in loss of usable ground". The Cultural Resource Assessment, found in the EIS states "The raising of the highway in front of those properties and the relatively small right-of-way expansions and temporary construction easements within those properties are expected to have no effect on their historic values." The roadway expansion remains within the 50-foot easement included in the EIS.

Concessions and Tribal Billboards

Existing Condition and 2020 Design:
There are currently 24 concession signs located in the project area along Tamiami Trail (Figure 15). These signs have been present along the roadway for a long period of time and range in size from small placards to large billboards. Most of the signs (20) belong to NPS concessions businesses for airboats rides, 4 of the billboards belong to businesses owned by the Miccosukee Tribe or members of the tribe - 2 billboards for Buffalo Tiger Airboat Rides and 2 billboards for the Miccosukee Village.

As the roadway expands to the south as part of this project, all of these signs will need to be removed. ENP Management has decided that each business will have 2 billboards, one approaching their business from each direction (east and west), for a total of 10 signs. These billboards will be placed directly south of their current location on Everglades National Park property. NPS hopes to place the billboards in the treatment swale or on the berm, otherwise the area where they will be placed will be in wetlands, and their impact will be included in the final wetland impact values.

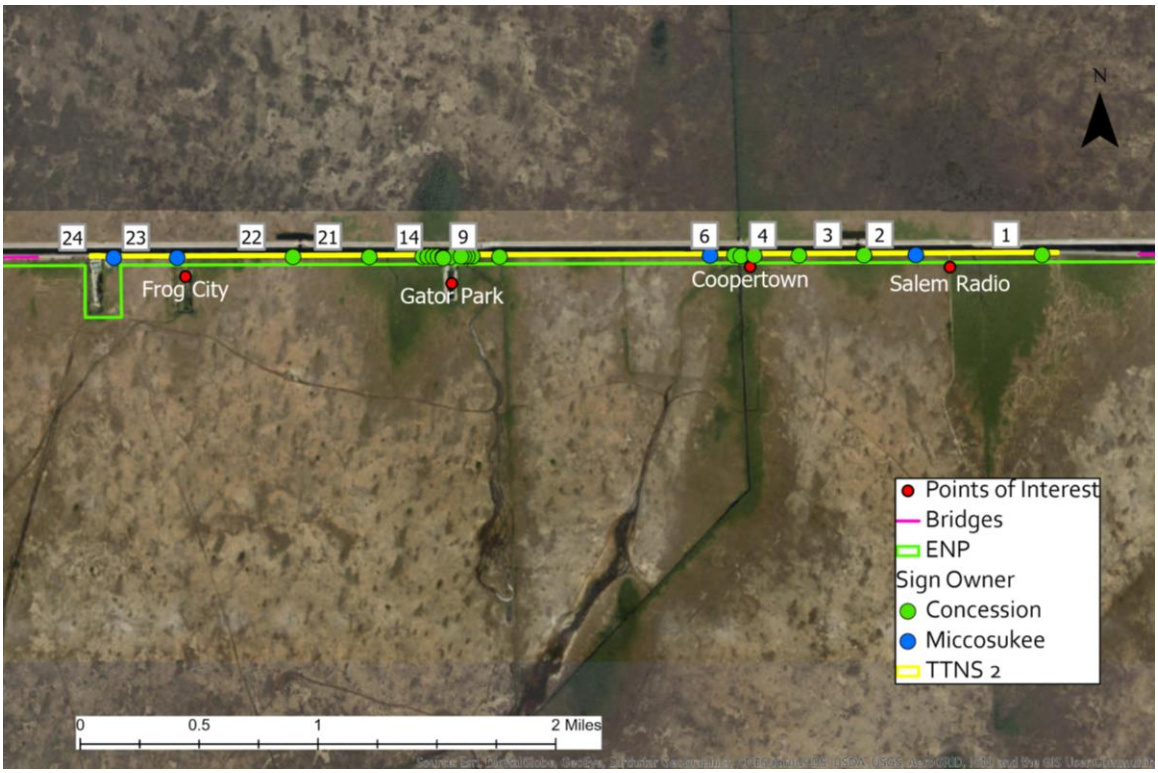


Figure 15. Current Location of Concessions and Tribal Business Billboards and Signs

Changes from 2018 Confirmation of Previous Analyses:
Billboards were not considered in the 2018 Confirmation of Previous Analyses.

Changes from EIS:
All the work is expected to be kept within the 50-foot construction easement.

5. Changes in Environmental Impacts and Effects Determinations

The 2018 Confirmation of Previous Analyses compared the benefits of proposed alternative 2 (making modest conveyance improvements, reconstructing the Tamiami Trail roadway, and replacing the remaining culverts in kind) to the Original Plan from the 2010 EIS (Alternative 6e). This analysis compares design modifications made during the 2019 VA to the effect analysis for Alternative 2 (2018 CPA) and the 2010 Final EIS. The earlier Confirmation Assessment determined that these changes were consistent with the benefit analyses and impact determination in the 2010 Final EIS. This analysis confirms that the effects of the project remain consistent with the 2018 Confirmation Assessment and the 2010 Final EIS.

A full summary of the impact assessments is included at the end of this report (see Section 4. Table of Impacts). The impact thresholds used in this section (negligible, minor, moderate, major) and in the Table of Impacts are those used in Chapter 4 of the TTNS Final EIS.

a. Hydrology

The Confirmation Assessment of 2018 determined that replacing 2.8 miles of additional bridging with six box culverts would achieve 78% of the benefits and cost significantly less that the Original Plan, Alternative 6e. Alternative 2 (2018 VA) "with 3.3 miles of bridging and six large culverts, scored higher on reconnecting historic sloughs, and met the original project objectives for unconstrained flows, marsh connectivity, restoring sheetflow, and recreating marsh flow velocities" than Alternative 6e.

Minor changes in the design of the hydrologic features from Alternative 2 were made during the 2019 Value Analysis. These changes are largely design changes and have negligible impacts to the hydrologic performance of the project. It was determined that using slab bridges, instead of prefabricated culverts would have wildlife, construction, and maintenance benefits with no alteration to the hydrologic benefits. The remaining culverts that are to be replaced 'in kind', would be replaced with similar pipe material but the minimum diameter of the pipe would be increased to 8 feet. Increasing the diameter of the pipe prevents the need to have 'manatee grates' installed over the mouth of the culvert. There will be no reduction in culvert conveyance capacity as a result of moving to 8-foot culverts and in all cases will result in an overall increase at each culvert (Table 2). Because the culverts will also be larger, the less constrained flow will result in lower velocity flow into the marsh which is beneficial.

The impacts of the design changes on hydrology will be the same as Alternative 2. Project construction will have short-term, adverse, minor, localized impact on hydrology associated with project construction. The project will have a long-term, beneficial effect on hydrology based on its capacity to convey full CERP flows at relatively low velocities.

Table 2. Current and Proposed In-Kind Replacement Culvert size.

Culvert #	Current			Phase II		
	# culverts	Diameter (ft)	Area (ft2)	# culverts	Diameter (ft)	Area (ft2)
41	3	4.5	47.7	1	8	50.3
42	3	5	58.9	2	8	100.5
50	3	5	58.9	2	8	100.5
52	1	5	19.6	1	8	50.26
53	3	5	58.9	2	8	100.5
58	3	3.5	28.9	1	8	50.3
59	3	4	37.7	1	8	50.3

b. Soil Impacts

Short-term impacts to soils in Northeast Shark River Slough would occur during Phase 2 project construction. Based on the construction activities during Phase 1, no access routes for removal of excavated material will be needed outside of the new roadway and swale prism. Disturbance and compaction of soils is anticipated from temporary construction-related activities and would be limited to the new roadway prism. Soil impacts resulting from temporary construction-related activities for the Phase 2 roadway work are expected to remain adverse, local, minor, and short-term. The estimated permanent acres of soil impacts associated with the Phase 2 recommended design corresponds with the area of predicted wetland impacts and is approximately 35 acres (see Table 3). In Phase I there were 18.83 acres of permeant impacts to soils. The total impact from the two phases of the project is 53.83 acres, approximately 4 acres greater than estimated in the EIS. The Phase 2 impacts to wetland soils were estimated by summing the acreage of impacts from the freshwater marsh, mixed wetland hardwood/shrub, sawgrass marsh (see Figure 3). Additional temporary soil impact acreage is estimated to be zero during phase II, there should be no temporary impacts outside of the roadway and swale prism.

BMPs would be implemented to minimize impacts to soils resulting from Phase 2 construction and maintenance-related activities. Long-term effects to soils would result from roadway construction and maintenance. Organic soils would be excavated in the footprint of the roadway, slab bridges, culverts, and swales during construction. It is not anticipated that excavation of the soils and the vegetation layer within this construction prism will increase nutrient loading in the adjacent wetlands, or cause phosphorus assimilation processes to occur further downstream into ENP. Best management practices such as silt fencing and other erosion control actions would be implemented to minimize impacts to adjacent soils resulting from Phase 2 construction. Although the project would impact 4 acres more than calculated in the EIS, the impacts that result from this soil excavation and disturbance would be adverse, local, minor and long-term because organic soils would be permanently removed from the project area.

c. Wetland Impacts

This section describes the wetland impacts that are planned in conjunction with the revised design which incorporates 50% larger water quality treatment swales along the roadway. The size and extent of these swales was increased to meet water quality treatment levels that are protective of the Outstanding Florida Water designation by FDEP. While this design change results in an increased area of permanent wetland impacts, there will be a substantial reduction in nutrients and contaminants entering the Park as a result (see Water Quality section below).

For the purposes of this analysis, the amount of wetland impacts was calculated using GIS. Construction impacts to wetlands were determined by comparing the December 2019 project design Microstation® files to the wetland boundaries recorded during a 2019 jurisdictional wetland delineation. The wetland types impacted were determined by overlaying the wetland impact area with Florida Land Use and Cover Level 3 shapefile layer (SFWMD 2016). Updated wetland impact calculations were also performed using GIS for the Phase 1 project, using As-Built plans provided by FDOT. The impact amounts and types were then compared to the impact amounts and types expected under the Original Plan (6e) in the Final EIS.

This analysis represents the expected wetland impacts based on current data, and is not directly comparable to the analysis completed for the EIS for several reasons: 1) the wetland boundary may have changed due to vegetation changes and differences in jurisdictional delineations, 2) changes in delineation of cover classifications as a result of vegetation change or classification methodological differences, and 3) the wetland characteristics have likely changed since 2010 as hydrologic operational plans have begun lengthening hydroperiods and delivering more water to the area.

As in the December 2018 confirmation assessment, we are analyzing expected wetland impacts based on a generalized expectation of construction impacts. In the previous 2018 assessment, only conceptual design documents were available, as a result the analysis was based on estimated project boundaries. The 60% level of design available for this analysis is much higher than in the 2018 Confirmation of Previous Analyses, however we recognize that there may be continuing design refinements which may result in either increased or reduced wetland impacts. This analysis includes a small amount of additional hypothetical impacts that may occur within the same area through future design modifications. The December 2019 plan set that was the basis of this estimate has since been modified and reduces wetland impacts slightly; there have been some minor design changes and an area of the swales near the eastern extent of the project has been eliminated due to an existing easement.

The December 2019 design set, combined with the methods described above, showed expected impacts to 33.09 acres of wetlands (Figure 16). We have generalized that amount to 35 acres, approximately 6% greater than represented in this design iteration. In this manner, this evaluation represents a worst-case analysis in recognizing that additional impacts may be included in final designs. The NPS will continue to work with our partners and design engineers to minimize wetland impacts throughout the remaining design and construction.

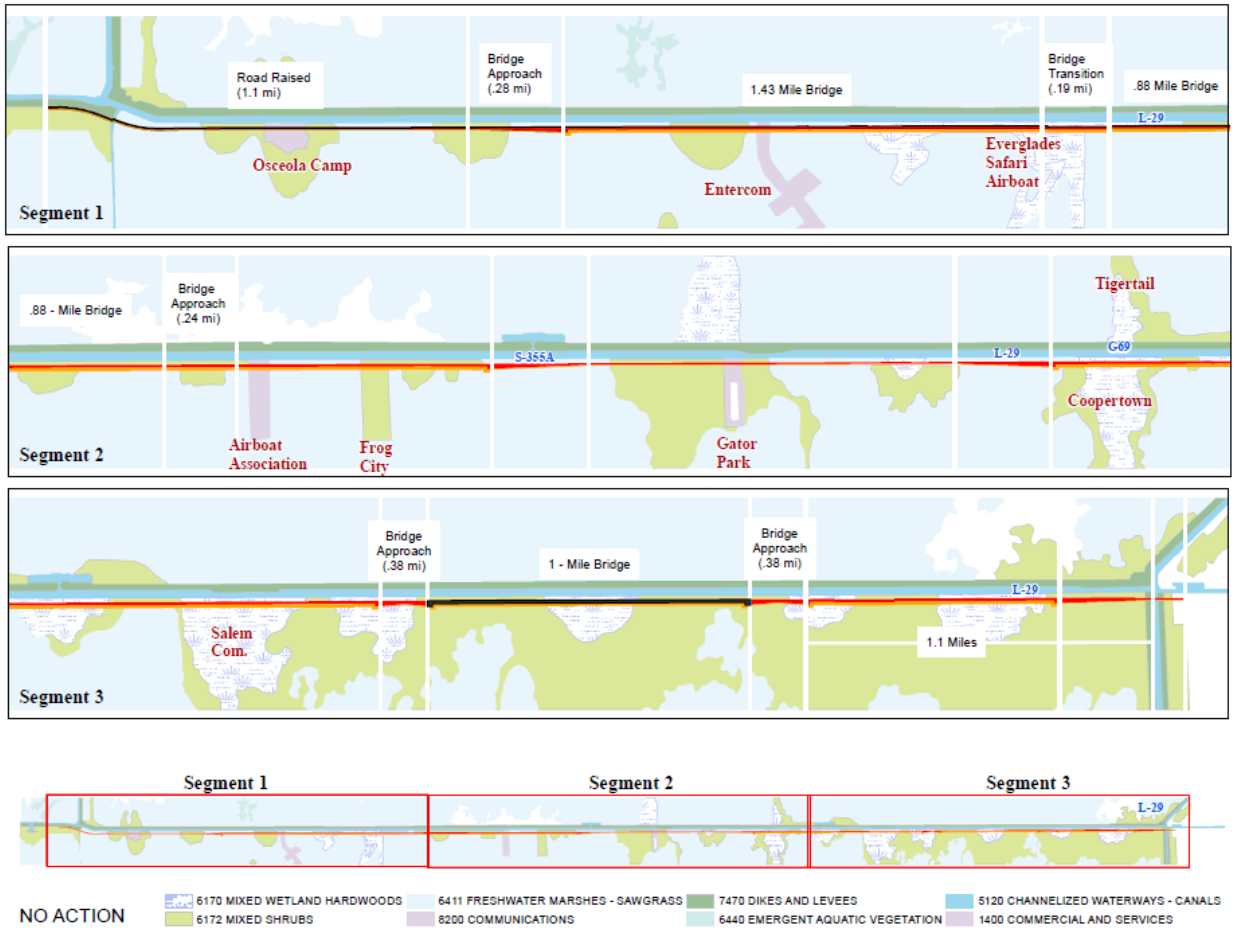


Figure 16. Florida Land Use and Cover map for the Tamiami Trail project area. This information was used to estimate soil and wetland impacts for the Phase 2 Recommended Alternative, compared to the No-Action Alternative.

Total wetland impacts for the Tamami Trail are now estimated to be 53.83 acres. This includes the 18.83 acres impacted in Phase 1 and the 35 acres of wetlands estimated to be impacted as a worst-case final design refinement for Phase 2. This permanent wetland impact is approximately 4.63 acres larger than the 49.2 acres of permanent impacts predicted for the Original Plan (Alt.6e) in the 2010 Final EIS. The amount is also larger than resulted from the December 2018 Confirmation Assessment. The Phase 2 plan has no temporary wetland impacts, compared to 22.4 acres for the Original Plan (Alt. 6e in the 2010 Final EIS). Table 3 provides the estimated permanent and temporary wetland impacts of the Original Plan as compared to wetland impacts from the Phase 2 with estimated design refinement.

Though the overall amount of wetland impacts is slightly larger than what was anticipated in the 2010 FEIS analysis, the Phase 2 plan with design refinements has very similar types of impacts as in previous analyses, and the wetland cover types impacted are proportional to those expected in previous analyses; no one wetland cover type is impacted substantially more than was previously considered.

Throughout all of the analyses from the 2010 Final EIS through present, permanent wetland impacts have been defined as the permanent changes to wetlands. This includes permanent conversion of wetlands to another type of wetland that still retains wetland value. Temporary impacts have been consistently defined in our analyses as impacts that are completely removed following completion of the project, with the expectation that they will revert to their previous condition and type over time. These definitions differ slightly from FDEP regulatory definition of temporary impact, which can include changes in wetland type or condition, such as areas underneath bridges.

The Original Plan described in the Final EIS included the creation of wetlands (or more correctly, open water areas) that would result from removal of the existing Tamiami Trail roadway. The three additional bridges proposed in alternative 6e (0.40-mile, 1.80-mile, and 0.70-mile bridges) are not included in the Phase 2 recommended alternative. As a result, the area under the bridges will not contribute wetland mitigation benefits to offset the impacts. These wetland/open water areas that would have been created in Alternative 6e, FEIS, total 21.93 acres (see Table 11), and are not included in the determination of wetland mitigation requirements.

Table 3. Estimated soil and wetland impacts of the Original Plan and the Phase 2 plan based on the Florida Land Use, Cover, and Forms Classification System analysis.

Project Design	**Permanent Impact (acres)**	**Temporary Impact (acres)**	**Estimated wetlands or open water created (acres)***
FEIS Alternative 6E Original Plan (2010)	49.2	40.0	21.93
Phase 1 as built	18.83	1.49	12.27
Modified Phase 2 Plan	35	0	0
Future removal of Lincoln Financial access road	0	0	4.96
Total planned	53.83	1.49	17.23

As described in the December 2018 Confirmation Assessment, no new wetlands/open water areas would be created by Phase 2 with the design refinement. Consistent with the 2010 FEIS, we currently propose to mitigate wetland impacts through mitigation credits from restoration activities at the Old Tamiami Trail Removal Project (OTT), if approved by both Federal and State wetland agencies. To date, the FDEP has indicated support for the OTT as mitigation. If the USACE requires other mitigation, ENP currently has mitigation credits reserved for the project at the Hole-in-the Donut (HID) wetland restoration\mitigation project.

In sum, despite the slightly greater wetland impacts compared to previous evaluations, the type and amount of wetland impact remains very similar to that considered in the 2010 FEIS, and the impact level is still consistent with a moderate level of impact. Most of this increased wetland impact is associated with the expansion of the stormwater detention and water quality treatment

system (swales and associated weirs and exfiltration trenches). This design refinement will decrease runoff and the associated nutrients and pollutants from the roadway, improving water quality and reducing wetland habitat alterations along the northern boundary of Everglades National Park.

UMAM Wetland Functional Units The Florida DEP conducted a preliminary Uniform Mitigation Assessment Method (UMAM) to estimate the wetland relative functional losses anticipated under an earlier design of Phase 2 in conjunction with submittal of the CERPRA permit application for Phase 2. The design that was analyzed indicated 32.08 acres of permanent wetland impacts which is slightly less than the 35 acres that we project in our worst-case assessment. Results of this preliminary tabletop UMAM are summarized in Table 4. These values may change when regulatory agencies complete the final UMAM once the final design has been determined.

The UMAM indicates that the Phase 2 recommended alternative will result in an overall reduction of 16.38 wetland functional units, through the fill of wetlands resulting from the widened road base. The NPS will acquire an equivalent number of wetland mitigation credits to offset these impacts, either at the OTT or the nearby HID mitigation project managed by NPS.

At this time, the USACE has not conducted a UMAM evaluation for Federal permits, but we anticipate similar scoring of functional value if they chose not to adopt the UMAM prepared in conjunction with FDEP.

Table 4. Uniform Mitigation Assessment Method (UMAM) Summary for the Phase 2 with design refinements, completed in conjunction with Florida DEP.

	Impact Assessment - Current Conditions[1]	**With Project[2]**
Location & Landscape Support	5	0
Water Environment	4	0
Community structure	5	0
SCORE[5]	0.47	0.00
Delta = [with-current]		-0.47
Acres Impacted[6]		24.18
Functional Loss (FL)[7]		-11.284
Time Lag[8]		
Risk Factor[9]		
Relative Functional Gain (RFG)[10]		
Acres of Mitigation Needed[11]		

The updated UMAM for the remaining features in the Original Plan in the 2010 FEIS indicate that alternative 6e would have resulted in a loss of 14.26 wetland functional units from permanent impacts. However, removal of some sections of the existing Tamiami Trail would result in creation of wetlands with a functional value of 5.13 functional units (includes the time lag and risk factor). This alternative would also require off-site mitigation for the remaining 9.13 functional units, and this amount would similarly be met at the HID or another permittee-responsible mitigation site. The NPS will assure that any off-site mitigation will meet the requirements for Clean Water Act permits, State Environmental Resource Permits, and other applicable permits, as well as maintaining consistency with the NPS Wetland Statement of Findings prepared for the 2010 FEIS. We will also address mitigation for potential impacts to wood stork foraging habitat, to maintain consistency with the 2010 Biological Opinion prepared in conjunction with the 2010 Final EIS.

In summary, the UMAM results show that the Tamiami Trail Next Steps Phase 2 project will have slightly greater wetland functional impacts than the Original Plan, but all necessary off-site mitigation will occur as analyzed in the 2010 FEIS and will fully mitigate for the project impacts to wetland function and values. It should also be noted that with implementation of future Comprehensive Everglades Restoration Plan projects, such as the CEPP, our long-term restoration benefits to wetlands are still expected to substantially outweigh the current project's impacts to wetland functions and values, though those future benefits are not assessed explicitly in the current evaluation. The NPS finds that the Tamiami Trail Phase 2 project is consistent with NPS Director's Order 77-1, which clarifies the service-wide no net loss of wetland policy, as well as Executive Order 11990 for the protection of wetlands, and associated State and Federal regulatory requirements, and the current assessment of wetland impacts is consistent with the Wetlands Statement of Findings prepared for the 2010 FEIS.

d. Water Quality Impacts

The Tamiami Trail Next Steps Phase 2 project will decrease runoff and the associated nutrients and pollutants from the roadway and improve the water quality along the northern boundary of Everglades National Park. Presently there is no existing stormwater collection system for the conveyance and disposal of stormwater runoff from the roadway in the project area. The existing roadway is crowned, and the stormwater runoff sheet flows off both sides of the road. The runoff discharges without control and treatment to the L-29 Borrow Canal along the north side of the road, and to the ENP wetlands along the south side of the road.

Highway runoff is a nonpoint source of pollution to surrounding water bodies. The most common contaminants in highway runoff are nutrients, heavy metals, inorganic salts, aromatic hydrocarbons, and suspended solids. Many of these substances accumulate on the road surface as a result of regular highway operation and maintenance activities. Heavy metals, such as lead, zinc, iron, chromium, cadmium, nickel, and copper, build up on the roadway as a result of ordinary wear of brakes, tires, and other vehicle parts. Paints and atmospheric deposition deposit lead on roadway surfaces. Regular vehicle traffic results in the dropping of oil, grease, rust, hydrocarbons, rubber particles, and other solid materials on the highway surface (FHWA, 2016).

These pollutants are washed off the roadway during rain events and can have adverse effects on surrounding water bodies and wildlife if no measures are taken to remove the contaminants before the runoff reaches the receiving waters. Surface and ground waters are both susceptible to contamination from highway runoff; and surface waters, such as wetlands are particularly vulnerable because they are directly exposed to contaminants.

Contaminants such as heavy metals and hydrocarbons can destabilize ecosystems because they often have toxic effects on biota and tend to bio-accumulate in the tissues of animals. Heavy metals often cause metabolic interference and mutagenesis. Hydrocarbon ingestion by fish, birds and other mammals often results in lung, liver and kidney damage which can lead to death. Long term effects are poorly understood, but ingestion has been shown to suppress to the immune system, cause organ damage, skin irritation and ulceration, and behavior changes in birds and mammals. Fish are often highly impacted by both heavy metals and hydrocarbons, adult fish may experience reduced growth, enlarged livers, changes in heart and respiration rates, fin erosion, and reproductive impairment.

Everglades National Park has been designated an OFW which requires the highest level of water quality protection. General water quality procedures and guidelines are set forth by the SFWMD and FDOT District VI. Additional state requirements for discharging to OFWs are set by FDEP and require treating an additional 50% water quality pre-treatment volume as part of the required retention so as not to allow for any additional degradation of water quality. The project will provide treatment for 9.4 ac-ft of total discharge, this is an increase of 100% over current roadway stormwater treatment in the project area.

FDEP representatives worked with project engineers to design a swales system to capture 95% of highway runoff. Vegetated swales provide water quantity and water quality control by storing runoff temporarily and allowing suspended solids and other highway runoff contaminants to settle into the bottom of the swale and filter water through grass and soil. The stormwater system will capture sediments and fines that wash off the roadway and prevent floatables such as oil and grease from being discharged into the receiving marsh. The swale system will also provide additional protection from accidental spills of hazardous materials resulting from vehicle mechanical failures and accidents, providing the opportunity to contain and clean up materials within the managed stormwater system rather than allowing it to disperse into the downstream waters. All the swales are designed with a control structure and bleeding mechanism which will maintain water quality criteria and prevent the erosion of the southern banks of the swales in the case of a major rainfall event. There will be 37 control structures (overflow weirs) along the length of the project from the swales into Everglades National Park.

Short-term effects on water quality in Northeast Shark River Slough would occur during project implementation. Excavation of the project area and other construction-related disturbance activities are anticipated to potentially cause temporary impacts to water quality such as increased total phosphorus, total suspended solids, and turbidity in the downstream surface water. To minimize water quality impacts, BMPs would be implemented during roadway construction. These practices would include employment of staked silt fences and turbidity barriers. Silt fences would be employed prior to commencement of construction around the outer

perimeter of each work zone to minimize the potential for impacts to adjacent undisturbed wetlands. Turbidity barriers would be employed in canals and deep-water sites prior to commencement of construction at a sufficient distance from the work zone to create a temporary mixing zone upstream and downstream of the project area to allow for settling of any turbidity generated during construction. Additionally, a turbidity monitoring plan would be employed during construction. If monitoring reveals that turbidity levels exceed the standards, construction activities would be immediately halted and shall not resume until corrective actions are employed.

The effects determination on the most recent analysis (2018) found that adverse water-quality effects resulting from construction and maintenance of the Tamiami Trail roadway would be local, minor, and of short-term duration. The benefits to the project from the construction of the swale system described here and not considered in the earlier analysis will be local, minor to moderate, and long-term.

d. Land Use Impacts

Land use impacts have not changed substantially as a result of the design modifications in the 2019 VA. Approximately 96% of all permanent land use impacts are associated with the loss of wetlands to expand the new transportation corridor and stormwater management features. No temporary wetland impacts are expected as a result of this phase of the project outside of the roadway and swale prism. Impacts resulting from this conversion are discussed in detail in the prior wetland impact section. Conversion of commercial and developed land uses combined are comparable to impacts in the 2018 Confirmation Assessment and the 2010 EIS. These short and long-term impacted areas include the entrances and parking areas at Gator Park and Coopertown, the entrance for the Airboat Association, and at the Osceola Camp.

The areas impacted at the Airboat Association and Osceola Camp are located in the FDOT right of way. The Osceola Camp uses this area as informal parking. The entrances and parking areas at both Gator Park and Coopertown will be affected by the project. The roadway expansion will limit the entrances of Coopertown and Gator Park to one driveway, instead of the broad access along the road right of way. Gator Park will lose 26 parking spaces as a result of the project. Coopertown will lose an estimated 29 spaces from their main paved lot and their limestone fill ‘employee parking’ area.

ENP is currently working with the business owners on a ‘Cures’ project, which is intended to raise the elevation of the buildings and parking lots to prepare for increased water levels that result from restoration. ENP would work with Coopertown and Gator Park through the Cures project to help mitigate the parking area lost as a result of TTNS Phase 2. The replacement parking would be placed on previous existing filled areas and would have no additional wetland impact.

These commercial, and developed land use areas will experience short-term adverse impacts due to the Phase 2 roadway construction activities. These include entrances that can be temporarily blocked by construction activities, noise and dust generated by construction activities, and traffic detour activities while the entrances to these facilities are raised to merge with the new elevated

roadway. Construction activities may temporarily dissuade customers from visiting a commercial business operation or reduce the enjoyment of customers utilizing the business site.

Long-term, adverse impacts are associated with the loss of commercial or developed land uses to expand the transportation corridor; however, these impacts are considered minor to moderate given the acreages that are involved and the planned remedies. Any impacts would be short-term, adverse, and highly localized. Long-term impacts are considered beneficial, since the roadway reconstruction would raise the entrance roads and add left turn lanes to the commercial entrances, tribal camps, and the Airboat Association. The new transportation corridor would be more stable, safe, and reliable, particularly during high water events.

e. Endangered Species Effects Determination

This section describes the threatened and endangered species impact assessment and effect determinations under Section 7 of the Endangered Species Act for the Phase 2 recommended alternative with design refinement. It also compares the expected effects with those expected under the Original Plan – Alt. 6E in the 2010 FEIS and associated Biological opinion dated July 26, 2010, the Tamiami Trail Next Steps Phase 1 project and associated July 8, 2014 biological opinion amendment, and the preliminary effects analysis of the Phase 2 project prepared in conjunction with the December 2018 Confirmation Assessment.

The amounts, types, and locations of soil and wetland impacts in the Phase 2 plan are similar to those expressed in Alt 6e in the 2010 FEIS. The permanent impacts to wetlands and soils exceed the permanent impacts identified under Alt 6e by approximately 4 acres. primarily as a result of the addition of stormwater treatment features in the Phase 2 refined design. However, there are approximately 38 acres fewer temporary wetland impacts combined across all phases of the project. The 2010 biological opinion associated with the project identified an expected 100.3 acres of impacts in total, which remains substantially more than the expected permanent and temporary impacts to wetland habitats for listed species.

The 2010 biological opinion also did not include creation of wetlands (open water areas) resulting from the removal of the existing Tamiami Trail at the bridges, due to uncertainty and timing of potential availability. Over time, these areas may contribute prey base that will benefit listed species and support foraging by wood storks (*Mycteria americana*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), and Florida panther (*Puma concolor coryi*); however, this difference does not alter the Section 7 effect determinations for threatened and endangered species described in the Original Plan FEIS.

The 2014 biological opinion amendment and the December 2018 confirmation assessment both addressed newly listed species. Since the 2018 amendment, critical habitat has been proposed for the Florida bristle fern, and we consider the effects of the Phase 2 project on that proposed critical habitat below. We are additionally aware that U.S. Fish and Wildlife Service is considering designating critical habitat for the Florida bonneted bat in conjunction with a lawsuit settlement. While the critical habitat has not yet been proposed, we believe that it may be proposed in the vicinity of the project based on a briefing we received from the U.S. Fish and

Wildlife Service, and we consequently are considering in greater detail what we believe may be essential features of their habitat, informed by recent USFWS guidance on bonneted bats.

Table 5 below provides the list of species, the Section 7 determinations of effect for the Phase 2 project, and the determinations relative to the 2010 biological opinion on the Tamiami Trail Next Steps project (FEIS).

Table 5. Threatened, Endangered, and Proposed species considered during Section 7 consultation on the Tamiami Trail Next Steps Phase 2 project with design refinement.

Species	Scientific name	Listing Status	Section 7 determination	Change from 2010 biological opinion
Cape Sable seaside sparrow	*Ammodramus mariitimus mirabilis*	Endangered, designated critical habitat	MANLAA	None -Confirmation of previous analyses
Wood stork	*Mycteria americana*	Threatened	Likely to adversely affect	None -Confirmation of previous analyses
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	Endangered, designated critical habitat	MANLAA	None. Confirmation of previous analyses
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Proposed threatened	MANLAA	Not addressed in 2010
Florida leafwing butterfly	*Anaea troglodyta floridalis*	Endangered, designated critical habitat	No effect	Not addressed in 2010
Bartram's scrub hairstreak	*Strymon acis bartrami*	Endangered, designated critical habitat	No effect	Not addressed in 2010
Florida bonneted bat	*Eumops floridanus*	Endangered. Potential future proposed critical habitat	MANLAA	Not addressed in 2010
Florida panther	*Puma concolor coryi*	Endangered	Likely to adversely affect	None -Confirmation of previous analyses
West Indian manatee	*Trichecus manatus*	Threatened, designated critical habitat	MANLAA	None -Confirmation of previous analyses
Blodgett's silverbush	*Argythamnia blodgettii*	Threatened	No effect	Not addressed in 2010
Pineland sandmat	*Chamaesyce deltoidea ssp. pinetorum*	Threatened	No effect	Not addressed in 2010

Cape Sable thoroughwort	*Chromolaena frustrata*	Endangered	No effect	Not addressed in 2010
Florida prairieclover	*Dalea carthagenensis var. floridana*	Endangered	No effect	Not addressed in 2010
Florida pineland crabgrass	*Digitaria pauciflora*	Threatened	No effect	Not addressed in 2010
Everglades bully	*Sideroxylon reclinatum ssp. austrofloridense*	Threatened	MANLAA	Not addressed in 2010
Florida bristle-fern	*Trichomanes punctatum ssp. floridanum*	Endangered, proposed critical habitat	No effect	Not addressed in 2010
Eastern indigo snake	*Drymarchon corais cooperi*	Threatened	MANLAA	None -Confirmation of previous analyses

Within this document, we are only addressing updated information on impacts resulting from the revised design of Phase 2 while taking into account the impacts of Phase 1 construction but are not updating the analysis of the entire plan in the FEIS.

"Likely to Adversely Affect" Determinations

Wood Stork - The circumstances affecting the threatened wood stork that were considered in the FEIS remain largely unchanged and the analysis in the biological opinion is still applicable. Compared to the biological opinion, the proposed impacts of Phase 2, when considered in conjunction with the effects that have already occurred during construction of Phase 1, are still less than those assessed in the 2010 biological opinion. The incidental take in the 2010 biological opinion was assessed in terms of the area of lost foraging habitat and the prey biomass. The total wetland impacts in total with Phase 2 including the design refinement are less than the 100.5 acres anticipated under the biological opinion. Additionally, since the 2010 FEIS and biological opinion, hydroperiods in northeast Shark Slough have lengthened as operational plans have moved toward delivering more water in alignment with the intent of the Modified Water Deliveries project. The 2010 biological opinion indicates a hydroperiod of approximately 252 days, which is considered a Class 5 hydroperiod, and the biomass of fish production to support wood storks was calculated accordingly. From 2010 to present, annual discontinuous hydroperiod has increased to approximately 315 days, which corresponds to a Class 6 hydroperiod, and has an expected greater fish biomass than occurred in the area in 2010. We applied the methodology used in the 2010 Biological Opinion and determined that the 35 acres of wetland impacts anticipated in Phase 2 will result in a loss of 154.67 kg of fish biomass. When combined with the estimated lost prey biomass from Phase 1, the overall lost biomass for the Tamiami Trail Next Steps project, including Phase 2 with design refinement, is 237.69 kg, still less than the 387.29 kg identified in the incidental take statement in the 2010 biological opinion.

Wetland impacts are proposed to be offset through mitigation at the nearby Hole-in-the-Donut mitigation site, or through the removal of the Old Tamiami Trail roadbed within Everglades

National Park. Both of these potential mitigation sites will also increase wood stork foraging habitat and prey productivity and largely replace the reductions in foraging suitability within the core foraging habitat of the three stork colonies that occur near Tamiami Trail (Table 6). These additional benefits to wood stork foraging were not considered in the 2010 FEIS or biological opinion, and further reduce overall project impacts to stork foraging.

Table 6. Wood Stork nesting in 3 colonies along Tamiami Trail

Year	Wood Stork Colony maximum nests counted per year		
	Tamiami West	Tamiami East 1	Tamiami East 2
2010	350	15	30
2011	400	0	0
2012	120	0	0
2013	400	5	0
2014	300	0	0
2015	75	0	0
2016	0	0	0
2017	138	0	0
2018	0	0	0
2019	12	0	0
Preliminary 2020	0	0	0

Impacts to wood stork colonies are also reduced under Phase 2 compared to the analysis in the FEIS and biological opinion. The Tamiami East 2 colony referenced in the 2010 Biological Opinion has now been unoccupied for 10 years (as of 2020), and based on USFWS guidelines, no longer requires consideration as a nesting colony (Bill Brooks, USFWS wood stork species recovery lead, personal communication 2020). This colony would not be impacted by Phase 2. Tamiami East 1 colony has not been active for several years, but still requires consideration.

The 2010 biological opinion identified potential permanent impacts to wood stork nesting habitat within the Tamiami West stork colony. GIS comparisons of the specific areas impacted in that vicinity of Tamiami West compared to the FEIS Alt 6e indicate that permanent impacts within and adjacent to the colony are substantially less under Phase 2 with design refinement than was anticipated the Original Plan Alt 6e, primarily as a result of the elimination of the bridge at this site in Alt 6E. All impacts of Phase 2 fall within the boundaries of the permanent impact polygons for Alt 6E. Additionally, the impacts are reduced through elimination of temporary wetland impacts in the vicinity of the colonies.

Phase 2 does include construction within the buffer zones of existing wood stork colony sites, but those effects are also reduced. Instead of building an elevated bridge (with a larger area of habitat disturbance) near the Tamiami West wood stork colony, Phase 2 proposes to expand the road base and widen the road prism. This activity still has the potential to result in disturbance to nesting storks, but these effects, with associated mitigations, were fully addressed in the 2010 BO, and disturbance and potential mortality to storks through collisions are likely reduced since

the proposed road bed elevation in Phase 2 is below the tree canopy level, instead of at or near the tree canopy immediately adjacent to the Tamiami West colony in alt 6E.

After evaluating all of the potential effects that the Phase 2 project will have on wood storks and comparing those effects to what was described in the 2010 biological, the adverse effects to wood storks under Phase 2 are reduced. We believe the Phase 2 with design refinement falls completely within the analysis of effects and resulting incidental take in the previous 2010 BO and 2014 amendment.

Florida panther - There has been no additional information about panther occurrence in or near the project area in recent years that would change our previous consideration of this species. The proposed Phase 2 project, when considered in conjunction with the construction of the 2.3-miles of bridges in Phase 1, is expected to have fewer potential impacts to Florida panthers than what was considered in the 2010 FEIS and associated biological opinion. We analyzed the impacts of Phase 2 in the same manner as was conducted in 2010, and calculated Panther Habitat Units impacted. In addition to the 35 acres of wetlands impacted, with a panther habitat value of 0.5), we identified approximately 0.65 acres of uplands composed of mixed hardwoods, much of which is exotic vegetation, and some of which is adjacent to the developed sites such as the airboat concession operations. We applied the panther habitat value of 0.9 to these wooded uplands. Developed areas received a score of 0. Using these values and applying the 2.5 multiplier that was determined for habitat value within the panther primary one, Phase 2 with design refinements will impact 452 PHUs. When this total is combined with the Phase 1 impacts of 194 PHUs, the total impacts remain less than the 1,278.48 panther habitat units that have been allocated for the Tamiami Trail Next Steps project resulting from restoration in Picayune Strand that were identified in the 2010 BO.

In the December 2018 confirmation assessment, we also identified that the swales added in Phase 2 may also provide additional benefit for panthers. The construction of a stormwater treatment swale immediately south of the existing roadway may provide a high-likelihood movement corridor that will not subject panthers to increased risk from roadway mortality. The elevated berm on the south side of the swale will be well-separated from traffic flow. This potential benefit remains or may be slightly greater in Phase 2 with the design refinement because the additional swale width and resulting added (but small) increase in separation from traffic may further improve the likelihood of panther use as a travel corridor. There was no such feature proposed in the FEIS.

In total, the types of effects under Phase 2 are the same as those considered in Alt 6E and the 2010 biological opinion, and the amount of adverse impacts is reduced relative to the BO. Consequently, we believe the proposed change in design for Phase 2 falls completely within the analysis of effects and resulting incidental take in the previous BO.

"May Affect, but Not Likely to Adversely Affect" Determinations.

The December 2018 Confirmation Assessment provided updated information and section 7 determinations for other listed species for the proposed design of Phase 2 compared to the FEIS, and taking into account updated information about the status of the other species considered in

the biological opinion, the effects considered previously, and newly listed or proposed species. Most of that analysis and information included in that document still applies, and we are only providing relevant updates since the 2018 confirmation assessment.

Table 7 provides a list of the species for which there are no new project-specific effects or significant changes in species occurrence or abundance within the action area, and we refer readers to the Confirmation assessment, 2010 Biological Opinion, and 2014 amendment to the biological opinion for detailed discussion.

Table 7. Species for which there are no substantial changes in status or effects compared to previous analyses

Species	Scientific name
Cape Sable seaside sparrow	*Ammodramus mariitimus mirabilis*
Florida leafwing butterfly	*Anaea troglodyta floridalis*
Bartram's scrub hairstreak	*Strymon acis bartrami*
Blodgett's silverbush	*Argythamnia blodgettii*
Pineland sandmat	*Chamaesyce deltoidea ssp. pinetorum*
Cape Sable thoroughwort	*Chromolaena frustrata*
Florida prairieclover	*Dalea carthagenensis var. floridana*
Florida pineland crabgrass	*Digitaria pauciflora*
Everglades bully	*Sideroxylon reclinatum ssp. austrofloridense*
Eastern indigo snake	*Drymarchon corais cooperi*

In this section, we briefly provide only the new information about species or changes to the effects analyses compared to previous analyses.

Everglade snail kite and its critical habitat – In 2019 and 2020, there were elevated numbers of snail kites using a portion of the region prior to peak breeding season in January and February. We received records of aggregations of 20-30 kites in some areas. Most of these snail kites did not remain in the area to breed, and we only recorded nesting that was very similar to previous years – less than 5 nests, many of which were located along airboat trails or old canals. We believe the increased use may be related to lengthening hydroperiods and resulting availability of prey that are associated with the additional deliveries of water to Northeast Shark River Slough. This increased seasonal use does not change previous section 7 determinations of effect. There were no changes to their designated habitat.

Eastern black rail – This species remains proposed for listing as threatened. We have not conducted surveys and have no new information immediately adjacent to Tamiami Trail. However, several surveys for black rails have been conducted in other parts of Everglades National Park and adjacent lands, and rails were detected in many places, including areas where

they had not been previously reported. This information supports the potential that they may occur in the vicinity of the project, though it remains unlikely that they would occur immediately adjacent to the existing road. This new information does not change previous section 7 determinations of effect**.**

Florida bonneted bat – We have little new site-specific information about bonneted bats, though acoustic surveys in the general area continue to suggest that the species is present, but not abundant. As mentioned previously, we are aware that proposed critical habitat may be announced in coming months, and consequently seek to consider potential essential features of habitat more thoroughly. On October 22, 2019, the USFWS released new guidance on consultation and surveys of the Florida Bonneted bat, in the form of a consultation key issued to the U.S. Army Corps of Engineers.

Based on the key and the definitions it includes, the Phase 2 project area contains limited potential roost habitat in limited areas where large trees occur, primarily associated with developed sites, other uplands, and woody vegetation halos downstream of existing culverts (though most trees in those areas do not meet all criteria to be identified as potential roosts). In addition, the project contains foraging habitat – the mostly open sawgrass- and shrub- dominated wetlands. The project area is greater than 5 acres in size, and consequently is recommended for complete surveys. We have not conducted complete surveys in the area, though limited acoustic and cavity surveys were conducted in the general area in the past. Past surveys indicated that bats are present, but did not suggest that roosting was likely. Considering only the information obtained in past surveys, the key would recommend a not likely to adversely affect determination, which is consistent with our past analyses. We request USFWS concurrence with this determination for Phase 2. In coming months, we will conduct acoustic surveys in the area that are more aligned with the newly recommended survey protocols, and will revise our determinations if we find results that differ from previous assessments.

With respect to habitat characteristics, the Phase 2 project may have limited adverse effects on potential roost habitat, which is limited to the small fraction of the area that has large trees or other potential roost sites (mostly manmade at the developed sites). Because of the limited amount of potential roost habitat and the relatively low quality, the Phase 2 project may affect but is not likely to adversely affect roosting habitat.

The main cover type within the Phase 2 project footprint is consistent with foraging habitat – composed of open wetlands with low shrubs and grass where bats could easily travel. Because most of the project footprint is immediately downstream of the current Tamiami Trail, which is lined by small woody vegetation (generally < 20 ft in height), and the frequent vehicle traffic, the area likely represents relatively low-quality foraging habitat. The construction of swales in Phase 2 would still support limited use by foraging bats, and the high-quality vegetation downstream of the swales may benefit from removal of contaminants by the swales. Consequently, the Phase 2 project will primarily change the characteristics of foraging habitat but will not eliminate potential foraging. Consequently, ENP believes the Phase 2 project may affect but is not likely to adversely affect the overall availability and suitability of foraging habitat.

West Indian Manatee – The proposed Phase 2 project with the slab bridge design modification increases the size of six current culverts under Tamiami Trail and installs larger box culverts at the locations of seven other existing culverts to improve conveyance. These enlarged features exceed the dimensions for which manatee grates are recommended, and we want to eliminate manatee grates to reduce vegetation accumulation and maintenance requirements. The proposed features are large enough that entrapment of manatees is unlikely, but manatees may be able to move under the roadway at these sites. Recognizing the VERY limited use of this area by manatees in conjunction with dimensions that should allow manatees to turn around and avoid entrapment, we believe this change does not represent a substantial change from what was considered previously, and we still maintain our determination that the project may affect but is not likely to adversely affect manatees. The project will have no effect on manatee designated critical habitat.

Florida bristle fern – There is no new information to suggest that the Florida bristle fern may occur within the project area, and we maintain our previous determination of no effect for this species. However, on February 21, the USFWS proposed critical habitat for the Florida bristle fern in Everglades National Park. The 174-acre area is located at Royal Palm Hammock, far downstream from Tamiami Trail. We have reviewed the proposed critical habitat and determined that the proposed Phase 2 project will have no effect on the essential features of the proposed critical habitat.

f. Wilderness Impacts

Congress has identified 1,296,500 acres of land and water within Everglades National Park as federally designated Wilderness. Federal agencies manage wilderness areas to preserve wilderness character, including (1) untrammeled, (2) undeveloped, (3) natural, (4) offers outstanding opportunities for solitude or primitive and unconfined recreation.

The design changes prescribed in the 2019 VA will not change the project impacts to Wilderness as analyzed in the 2018 Confirmation of Assessment, or the 2010 FEIS. There is a ¼ mile buffer adjacent to the Tamiami Trail roadway inside Everglades National Park that was determined to be ineligible for the Wilderness designation. This buffer will lessen the impacts on the adjacent areas that are currently managed as Wilderness.

Impacts to Wilderness will be construction related. Noise and vibration from construction will be experienced in the wilderness areas adjacent to the Tamiami Trail. Construction-related noise and vibration would comply with all noise regulations and would be limited to the project area and close proximity only during periods of active construction. Construction related noise and vibration could affect wildlife near the construction area, affecting the natural quality of wilderness. These impacts could also affect visitor experience in the wilderness, both directly (disrupting visitors' opportunity for solitude) and indirectly by causing wildlife to flee the area near construction. These adverse effects are expected to be limited to the timeframe of construction and antecedent conditions are expected to fully return to the project area following completion of construction activities. Therefore, these adverse impacts to wilderness and the wilderness visitor experience are expected to be minor and short-term in nature.

Air quality impacts are also expected adjacent from the park as a result of construction. Short-term emissions generated from transport and construction equipment would be mitigated and would not measurably contribute adversely to air quality conditions or adversely affect visitor use and experience conditions in the wilderness. If needed, BMPs for dust suppression would be initiated. Emissions from construction equipment would be kept to a minimum by restricting idling time. Therefore, adverse impacts to wilderness and the wilderness visitor experience as a result of construction-related dust would be negligible.

Finally, minor short-term adverse effects to the visual aesthetics of wilderness would be experienced by visitors along the project corridor. The short-term impacts of the visual presence of construction vehicles and heavy equipment in construction zones along the project corridor should only cause minor disturbances to wilderness and the wilderness visitor experience.

g. ***Wildlife and Vegetation/Habitat Impacts***

The design changes prescribed in the 2019 VA will not substantially change the project impacts to Wildlife and Vegetation/Habitat as analyzed in the 2018 Confirmation of Assessment. These impacts, like those on Wilderness, are related to the presence of construction personnel and noise from operation of construction equipment. These activities will temporarily disperse wildlife to adjacent habitats. There remains the possibility of pollution, erosion, and sedimentation in the construction area, however BMPs will be used to minimize impacts, including the installation and inspection of silt fences, hay bale barriers, sediment traps, or other equivalent measures.

There are two active wading bird colonies within the vicinity of the Phase 2 project area, and effects to wading bird species and anhingas nesting within these colonies are anticipated to range from short to long-term and are at the moderate impact level. The project will not have a substantial effect on wading bird colonies, and effects may be limited to local changes in suitability of nesting, roosting, and foraging habitat. We would expect a similar level of impacts for other avian species that may be nesting within the project area.

Construction of the Phase 2 design would result in temporary and permanent loss of useable habitat by wildlife with effects that are anticipated to range from short to long term, and range from minor to moderate, dependent on the species. This could result in a loss of breeding, foraging, roosting, loafing, shelter, and/or ranging habitat. Based on availability of other useable habitat in the vicinity of the project area, the scale of the project, and the ability of wildlife to move away from disturbance activities, it is estimated that habitat losses resulting from implementation the Phase 2 plan would be minor for most fish, invertebrates, mammals, amphibians, and reptiles.

The ability for wildlife to move between habitat components is crucial for maintaining wildlife population health and diversity. Tamiami Trail has long represented a barrier to wildlife movement to the north and south and the construction of the six slab bridges in the Phase 2 plan would provide much improved access for species to move between habitats in the WCAs and Northeast Shark River Slough. A wildlife crossing shelf will be provided adjacent to all bridge abutments under bridge decks and the bottom under the bridge will be natural. Increasing the diameter of culverts replaced ‘in kind’ to eliminate the need to add grates to prevent manatee

entrapment will allow numerous species to continue to traverse under the Tamiami Trail and prevent additional vehicle collisions. However, the deaths of small animals from collision with vehicles would continue to occur in the unbridged sections of Tamiami Trail. The mortality of wetland dependent amphibians and reptiles and potentially some mammals would be somewhat reduced by the small bridges.

h. Cultural Resources Impacts

Section 106 of the National Historic Preservation Act of 1966 (as amended) requires federal agencies to consider the effects of projects (also called undertakings) they carry out, assist, fund, permit, license, or approve on historic properties listed, or eligible for listing, in the National Register of Historic Places (NRHP). The Tamiami Trail Next Steps Phase 2 (TTNS P2) project could impact several historic properties within the undertaking's area of potential effect (APE). These resources include the historic Tamiami Trail roadway, several historic commercial structures, the Miccosukee Osceola Camp, as well as visual and access modifications to these properties.

The NPS defined the undertaking's APE as (1) direct disturbance due to construction activities, and (2) diminishment of historical integrity as a result of indirect effects such as visual changes and limiting access. The APE for direct construction impacts was defined as those areas that could be disturbed by construction of additional bridges and raising the height of the unbridged segments of the Tamiami Trail within the project area. The construction limits are noted to extend up to 50 feet south of the existing roadway ROW. The APE for visual and access impacts is defined as including the properties along both sides of the Tamiami Trail within the project area.

Description of Undertaking and Project Modifications

Since the initiation of the project in 2010, several design modifications have occurred as either conditions changed over time or on-site construction inspections yielded additional information not available during the design phase of the undertaking. For example, in 2018 design changes required a reevaluation of impacts to historic properties. Addendum 1 (NPS 2018) analyzed the impact of changing the project design from three (3) large span (0.38, 0.66, and 1.77 mile) bridges to large culverts or small bridges in key locations. The evaluation found "no new adverse effect would occur due to the project change" (NPS 2018, SHPO Concurrence 12/10/2018 and 1/29/2020).

The 2019 VA determined it was necessary to replace six (6) larger culverts previously designed with small bridges known as Florida Slab Bridges. A Florida Slab Bridge is a prestressed, precast, concrete beam bridge, similar to a culvert but taller and the road surface can be directly laid on top of it (as opposed to a culvert that typically has earthen fill between the structure and road surface). An additional six (6) culverts would be replaced with larger eight (8) foot culverts instead of 'in-kind' as was previously designed. These design modifications would increase the impact to Tamiami Trail by an additional 0.07 miles.

Identification of Historic Properties

A cultural resource evaluation of the properties located along the project corridor was conducted as part of the preparation of the environmental impact statement (EIS) in July 2009 (Price et al. 2010). In addition to Tamiami Trail (8DA6510) and the Tamiami Canal (8DA6453) previously determined eligible, the Airboat Association of Florida, Coopertown Restaurant and Airboat Rides, and the Miccosukee Osceola Camp, were found to be eligible for listing in the NRHP. The Everglades Safari Park is located outside of the undertaking's APE; therefore, was not evaluated for listing in the NRHP. Since 2009, two additional assessments of properties within the APE were conducted to confirm past findings.

Table 8. Historic properties located within or adjacent to APE.

Park Site Number	SHPO Site Number	Site Name	Site Descrip.	NRHP Eligibility	SHPO Concur.	Within APE	Effect Determination
EVER 00248	8DA6453	Old Tamiami Canal	Canal	Eligible	Y	Non-contrib. segment within APE	No Adverse Effect
EVER 00247	8DA6510	Old Tamiami Trail	Road	Eligible	Y	Y	Adverse Effect
	8DA6767	Coopertown	Airboat Operation	Eligible	Y	Y	Adverse Effect
	8DA6768	Airboat Association of Florida	Airboat Operation	Eligible	Y	Y	No Adverse Effect
	8DA10088	Gator Park	Airboat Operation	Not Eligible	Y	Y	No Effect
		Miccosukee Osceola Camp	Domestic	Unevaluated/ Treated as Eligible	Y	Y	No Adverse Effect
		Everglades Safari Park	Airboat Operation	Unevaluated	N/A	N	N/A
		Tigertail	Domestic/ Parking Lot	Unevaluated/ Treated as Eligible	Y	Y	No Adverse Effect

In 2019, NPS reevaluated the eligibility of Gator Park, Tigertail, and the Miccosukee Osceola Camp for listing on the NRHP. Gator Park was found to be ineligible for listing in the NRHP (NPS, 2019; SHPO Response 1/29/2020).

The Miccosukee Osceola Camp was not evaluated due to access constraints. For the purposes of this undertaking, this property will be treated as eligible for listing on the NRHP and the Secretary of Interior Standards for Treatment of Historic Properties would be followed for actions occurring near these properties. The SHPO concurred with this recommended treatment on 1/29/2020. The NPS has determined that the TTNS P2 project will not have an adverse effect on the Osceola Camp.

The Miccosukee Tigertail Camp was not evaluated, however the NPS will treat the property as if it is eligible. The project will only affect the parking area along the northern side of Tamiami

Trail. The parking area is non-contiguous with the community and is not character defining of the community. The improved parking with access lane and diagonal spaces will continue to provide parking but will be safer for drivers entering and exiting the highway. The NPS has determined that the TTNS P2 project will not have an adverse effect on the Tigertail community.

Undertaking Impacts to Historic Properties

The Tamami Trail roadway was originally constructed in 1928 and is eligible for listing on the NRHP. Adverse impacts or damage to the Trail could occur as result of the TTNS P2 project due to increased water levels, changes to roadway embankments, and direct removal of the road to construct bridges or install culverts. The 2010 Final EIS/ROD concluded that the construction of Alternative 6e (5.5 miles of additional bridging and reconstruction of the remaining roadway) would have major adverse effects on the roadway. The 2018 plan removed the large bridges from the project design and instead recommended 6 large precast culverts and that the remaining culverts be replaced 'in kind'. This plan would have added approximately 0.1 miles of additional impact to the 3.3 miles of bridges constructed under phase 1 of the project (3.4 miles impact total). Overall, however, this design decreased the total impact of the TTNS project by 3.1 miles from Alternative 6e.

Table 9. Undertaking and Determination of Effect, under Section 106 of the NHPA.

Historic Property	Undertaking Action	Determination of Effect under Section 106
Old Tamiami Canal	No work is proposed that would affect the canal. There is not contributing segment of the canal within the APE	No Adverse Effect
Old Tamiami Trail	Modification of 5.5 miles of bridges, roadway, rights-of-ways as described in the Tamiami Trail Modifications: Next Steps Report and 2018 plan revisions. Segments of the Old Tamiami Trail will be removed within the APE.	Adverse Effect
Coopertown (8DA6767)	Construction of an elevated bridge across the front of the property and an access ramp that would require about 40% of the parcel for expanded right-of-way. The location the ROW adjacent to the structures will result in a visual impact to the district.	Adverse Effect
Airboat Association of Florida	FDOT has acquired approximately 17,457 square feet (0.4 acres) of land through a Murphy Deed issued by the State of Florida. NPS does not have authority or jurisdiction to fund or permit this type of land acquisition. However, the land transfer does not affect	No Adverse Effect

Historic Property	Undertaking Action	Determination of Effect under Section 106
	the historic integrity or eligibility of the Airboat Association of Florida for listing in the NRHP.	
Miccosukee Osceola Camp	The alignment of Tamiami Trail would shift southward, closer to Osceola Camp, and includes a left turn lane.	No Adverse Effect
Tigertail	The project will only affect the parking area located along the north side of the highway on the south side of the canal. The use of the shoulder will continue to provide parking for the community but will allow for greater safety for vehicles entering and exiting the highway. The parking area is a non-contiguous feature of the community and is not character defining of the community as a whole.	No Adverse Effect

In 2010, the NPS entered into a Memorandum of Agreement with the Florida State Historic Preservation Officer (SHPO) for the "Mitigation of Certain Adverse Effects to Cultural Resources by the Tamiami Trail Modifications: Next Steps Project." This MOA expired on March 31, 2013 in accordance to the terms of the agreement document.

Summary of Cultural Resources Impacts

The impacts from the recommended plan would remain less (-3.0 miles) than what was analyzed in the EIS. As a result, there will be no additional impacts to cultural resources as a result of implementation of the 2020 design modifications. The NPS and Florida SHPO have reinitiated consultation and have prepared a new MOA to finalize resolution of the adverse effects that were not completed in the 2010 MOA to Coopertown (8DA6767). The new MOA will resolve the adverse effects to Coopertown.

Table 10. Resolution of Adverse Effects, under Section 106 of NHPA.

Property	Determination of Effect	Resolution of Adverse Effects
Old Tamiami Trail	Adverse Effect	An interpretive display was completed and is on display at the Shark Valley Interpretive Area in accordance with the 2010 MOA. No further mitigation or resolution is required.
Coopertown	Adverse Effect	A wayside exhibit on Coopertown and the history of Airboat tourism on the Tamiami Trail will be developed and located at the Coopertown location.

Although the 2020 design widens the typical section, increases the width of water quality swales, and adds left turn lanes to the 2 airboat concessions, it was found to have similar impacts to the 2018 plan at the Airboat Association, Osceola Camp, and Coopertown. Overall, the project will have minor, short term effects on access to the properties as a result of construction activities, and minor long-term adverse effects on Coopertown after the road construction is complete. There are no new adverse impacts under the 2020 design refinements, these determinations are the same as the findings in the 2010 FEIS.

6. Table of Impacts

Table 11. Table of Impacts

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	Original Plan Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	2018 CPA Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Four Smaller Bridges, Culverts Replaced In-Kind	2019 VA Design Refinement Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, 6 Culverts with Slab Bridges, 7 Culverts replaced with 8 ft Diameter Culverts, Left Turn Lanes at Most Entrances, Tigertail Parking
Geology, Topography, and Soils	Effects on soils are related to short-term and long-term construction, operations, and maintenance activities. The soil impacts resulting from temporary construction related activities would be **adverse, local, minor, and short-term**. **Long-term** impacts resulting from implementing this alternative would be **adverse, local, and minor**. No impairment of soils is anticipated from construction and maintenance-related activities.	Same as Original Plan (EIS), with minor incremental differences due to bridge and roadway lengths.	Same as Original Plan (EIS), with minor incremental differences due to bridge and roadway lengths and increased roadway widths and increased stormwater retention areas.
Water Resources, Hydrology	Project construction will have a **short-term, adverse, minor, localized** impact on hydrology. The project will have a **Long-term, beneficial effect** on hydrology based on its capacity to convey full CERP flows at relatively low velocities. No impairment to hydrology as a result of implementation of Alternative 6e.	Same impact as Original Plan (EIS), with incremental differences due to bridge length. A **Long-term, beneficial effect** on hydrology based on its capacity to convey full CERP flows at relatively low velocities.	Same impact as Original Plan (EIS), with incremental differences due to bridge length. A **Long-term, beneficial effect** on hydrology based on its capacity to convey full CERP flows at relatively low velocities.
Water Resources, Water Quality	Water quality effects would be directly related to the short-term and long-term effects caused by construction, operations, and maintenance. It is anticipated that the water quality impacts resulting from construction-related activities would be **adverse, local, minor, and short-term**. **No long-term impacts** to water quality are anticipated, but stormwater runoff	Same impacts as Original Plan (EIS), with Incremental differences due to bridge length. A **Long-term, beneficial effect** on water quality, based on the addition of swales to handle roadway stormwater runoff.	Same impacts as Original Plan (EIS), with incremental differences due to bridge length. A **Long-term, beneficial effect** on water quality, based on the addition of swales to handle roadway stormwater runoff. Incremental improvements due to the 50% larger size of swales that Alternative 2 due to the necessity of OFW standards.

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	Original Plan Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	2018 CPA Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Four Smaller Bridges, Culverts Replaced In-Kind	2019 VA Design Refinement Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, 6 Culverts with Slab Bridges, 7 Culverts replaced with 8 ft Diameter Culverts, Left Turn Lanes at Most Entrances, Tigertail Parking
	could improve due to water quality treatment features in Alternative 1. No impairment of water quality resources/ values would occur from the implementation of Alternative 1.		
Water Resources, Wetlands	Alternative 6e results in approximately 49.2 acres of permanent wetland loss and 40 acres of temporary wetland loss. Some portion of the permanent loss would be offset by the creation of new wetlands/open water areas from the removal of the old roadway. This translates to **moderate, adverse, short-term, localized impacts** to wetlands during project construction. There would be **moderate, adverse, long-term, localized impacts** to wetlands associated with permanent dredging and filling of wetlands in conjunction with raising of the Tamiami Trail roadway. A **Long-term, beneficial effect** would be expected to result from **f**uture CERP improved water flows would substantially improve wetland functions throughout Northeast SRS. No impairment of wetland resources/ values would occur from the implementation of Alternative 6e.	Same impacts as Original Plan (EIS), with Incremental differences due to bridge length. **Moderate, adverse, short-term, localized impacts** to wetlands during project construction. **Moderate, adverse, long-term, localized impacts** to wetlands associated with raising the Tamiami Trail roadway. **A Long-term, beneficial effect** would be expected to result from **f**uture CERP improved water flows would substantially improve wetland functions throughout Northeast SRS.	Slightly larger area of wetland impacts than in the Original Plan (EIS), with incremental differences resulting from differences in bridging and addition of 50% larger swales to improve water quality. The levels of effect are the same as in the Original Plan. **Moderate, adverse, short-term, localized impacts** to wetlands during project construction. **Moderate, adverse, long-term, localized impacts** to wetlands associated with raising the Tamiami Trail roadway and addition of stormwater treatment structures. **A Long-term, beneficial effect** would be expected to result from **f**uture improved water flows resulting from Everglades Restoration projects, including CERP. These increased flows facilitated by the road base improvement and water quality treatment would substantially improve wetland functions throughout Northeast SRS.
Wilderness	**Minor, short-term, localized, adverse impacts** would occur to wilderness and unique ecosystems as a result of noise, vibrations, and dust. Long term, minor, adverse, localized impacts would occur from construction of the bridges associated with all the action alternatives. **Long term beneficial effects** would occur as a result of project implementation.	Same impacts as Original Plan (EIS), with incremental differences due to bridge length.	Same impacts as Original Plan (EIS), with incremental differences due to bridge length.
Wildlife and Vegetation, Habitat	**Short-term to long-term, minor to moderate, adverse, localized impacts** to wildlife and vegetation/habitats would result from the construction of Alternative 1. **Long-term beneficial effects** to	Same impacts as Original Plan (EIS), with incremental differences due to bridge length. **Moderate, adverse, short-term, localized impacts** to wildlife and habitat	Same impacts as Original Plan (EIS), with incremental differences due to bridge length. **Moderate, adverse, short-term, localized impacts** to wildlife and habitat during project construction.

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	Original Plan Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	2018 CPA Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Four Smaller Bridges, Culverts Replaced In-Kind	2019 VA Design Refinement Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, 6 Culverts with Slab Bridges, 7 Culverts replaced with 8 ft Diameter Culverts, Left Turn Lanes at Most Entrances, Tigertail Parking
	wildlife and habitat would result from the increased ecological connectivity provided through the implementation of Alternative 1, in combination with future CERP projects. Consequently, there would be no impairment of wildlife and habitat as a result of Alternative 1.	during project construction. **Moderate, adverse, long-term, localized impacts** to wildlife and habitat after construction. **A Long-term, beneficial effect** would be expected to result from **f**uture CERP.	**Moderate, adverse, long-term, localized impacts** to wildlife and habitat after construction. **A Long-term, beneficial effect** would be expected to result from **f**uture CERP.
Special Status Species	**Short-term to long-term, minor to moderate, adverse, impacts** to special status species would result from the construction of Alternative 1. This Alternative may affect but is not likely to adversely affect the Cape Sable seaside sparrow, Everglade snail kite, Eastern black rail, Florida bonneted bat, Everglades bully, West Indian manatee, and Eastern indigo snake. The Alternative is likely to adversely affect the Wood stork, and Florida Panther. Alternative 1 does include construction within the buffer zones of existing wood stork colony sites, and the bridge construction impacts would be **adverse, but short term**. Alternative 1 will have **moderate short-term** impacts to Florida panther habitat. No impairment of special status species is expected as a result of implementation of Alternative 1.	Same impacts as Original Plan (EIS), with Incremental differences due to bridge length. **Moderate, adverse, short-term, localized impacts** to special species and their habitat during project construction. **Moderate, adverse, short-term, localized impacts** to special species after construction. A **Long-term, beneficial effect for** the Florida panther is expected as a result of the six small pre-fabricated bridges.	Same impacts as Original Plan (EIS), with Incremental differences due to bridge length changes and installation of stormwater treatment features. **Moderate, adverse, short-term, localized impacts** to special species and their habitat during project construction. **Moderate, adverse, short-term, localized impacts** to special status species after construction through changes in habitat suitability. A **Long-term, beneficial effect for** the Florida panther is expected as a result of the six small pre-fabricated bridges, and long-term beneficial effects for wood stork, snail kite, bonneted bat through increased flows and habitat improvements associated with Everglades restoration facilitated by road raising.
Cultural Resources	There would **be significant, adverse, long-term effects** on the historic Tamiami Trail roadway associated with construction of 2.8-miles of additional bridges. There would be **minor, adverse, short-term effects** associated with construction to improve the entrance roads and parking area at three historic sites.	There would **be minor adverse short-term effects** on the Tamiami Trail roadway, entrance roads, and parking areas as a result of construction.	There would be **minor adverse short-term effects** on the Tamiami Trail roadway, entrance roads, parking areas, and historic properties as a result of construction. There would be **major, adverse, long-term** effects on the historic Tamiami Trail roadway and Coopertown as a result of the project. There would be **minor, adverse, long term** effects on the historic properties (Osceola, Airboat Association), as a result of the project. Note: Effects on historic properties, entrance roads, parking areas in this table are made under NEPA, not Sec 106 of the NHPA which are shown in

Impact Topic (From the 2010 Tamiami Trail Next Steps Final EIS)	Original Plan Alternative 6E from the Final EIS, 6.5- Miles of Additional Bridging, and Full Roadway Reconstruction, Culverts Replaced In-Kind	2018 CPA Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, Four Smaller Bridges, Culverts Replaced In-Kind	2019 VA Design Refinement Phase 1 completed. 3.3-Miles of Bridging and 1.5-Miles of Approaches, Full Roadway Reconstruction, 6 Culverts with Slab Bridges, 7 Culverts replaced with 8 ft Diameter Culverts, Left Turn Lanes at Most Entrances, Tigertail Parking
			Table 9 above. Adverse impact under NEPA does not necessarily mean adverse effects under Section 106 of NHPA. Consultation for resolution of adverse effects under Section 106 have been addressed through a Memorandum of Agreement with the SHPO.
Transportation	Transportation impacts associated with Alternative 1 would be **adverse, local, minor, and short term** and primarily associated with traffic delays related to construction activities. Mitigation of these effects would be through implementation of a Maintenance of Traffic plan. **No long-term impacts** associated with increases in traffic levels are expected. Construction duration: 3-5 years, most likely done in multiple phases.	Same or less adverse impacts compared Original Plan (EIS). **Adverse, local, minor, and short-term** effects would occur primarily due to traffic delays related to construction activities. Construction duration: 2-3 years, all done at one time.	Same or less adverse impacts compared Original Plan (EIS). Adverse, local, minor, and short-term effects would occur primarily due to traffic delays related to construction activities. Construction duration: 2-3 years, all done at one time.

7. Conclusions

The general conclusion from this 2020 Confirmation of Previous Analyses (CPA) is that the Phase 2 recommended modifications will meet the purpose and need of the TTNS project and result in improvements to the natural resource conditions within Everglades National Park that are generally consistent with the Original Plan (Alt. 6e in the 2010 Final EIS):

a. This 2020 re-analysis confirms that the Phase 2 modified plan would complete the requirements of the Tamiami Trail Next Steps project, and is consistent with the benefit analyses and impact determinations included in the 2010 Final EIS.

b. The 2018 re-evaluation of the hydrologic benefits of Tamiami Trail bridging determined that the existing 3.3 miles of bridging (the combination of the MWD/LRR and TTNS Phase 1) represents an optimal bridging plan and would provide sufficient water conveyance capacity to pass future CERP restoration flows.

c. Failing to reconstruction/raise the remaining 6.7-miles of the Tamiami Trail roadway would constrain L-29 Canal stage increases, limiting future restoration benefits in both the upstream Water Conservation Areas and ENP.

d. The Choosing by Advantages analysis in the 2018 Confirmation of Previous Analyses reiterated that the Original Plan from the 2010 Final EIS, with 6.5-miles of total bridges, scored better on restoring sheetflow, and reducing wildlife mortalities, but only slightly better on marsh connectivity, and recreating marsh flow velocities.

e. The Phase 2 modified plan (similar to the 2018 CPA Alt. 2), with 3.3-miles of existing large bridges and six 60-foot wide slab bridges, scores higher on reconnecting historic sloughs, and meets the original project objectives for unconstrained flows, marsh connectivity, restoring sheetflow, and recreating marsh flow velocities, given the L-29 Levee removal limitations expected in the Central Everglades Project's 2016 authorized plan.

f. The Phase 2 modified plan would have a projected 4.63 additional acres of permanent wetland impacts compared to the 2010 Original Plan. There would be no temporary wetland impacts compared to 22.4 acres in the Original Plan, by constraining all construction activities within the new roadway and swale footprint.

g. This increase in permanent wetland impacts is the result of enlarging the stormwater treatment system (swales, and associated exfiltration trenches and control structures). This swale system was enlarged (compared to the 2018 CPA conceptual design), to address the 50% greater treatment capacity requirement associated with the Outstanding Florida Water designation of Everglades National Park.

h. Eighteen threatened and endangered (T&E) species were evaluated in this analysis, with eleven that were newly listed and/or not evaluated in the 2010 Final EIS. Only two of these previously evaluated species, the Wood stork (*Mycteria Americana*) and the Florida panther (*Puma concolor coryi*) had Likely to Adversely Affect determinations. Since the wetland impacts under the Phase 2 modified plan are only slightly larger than the Original Plan, losses to T&E species habitat would be minimal, and this did not change the effect determinations.

i. The cultural resource impacts to the Tamiami Trail roadway under the Phase 2 modified plan would be less than the Original Plan, since 2.8-miles of additional bridging would not occur. There would still be no direct impacts to historic structures, but adjacent entrance roads and parking areas would be reconstructed to match the raised roadway.

j. Life Cycle Costing analysis in the 2018 Confirmation of Previous Analyses determined that replacing 2.8-miles of additional bridging with six larger culverts (or slab bridges), as well as the other recommended modifications, lowers the total project cost by more than $118 million, while achieving 78% of the benefits (maximum importance value).

k. The Phase 2 modified plan includes roadway improvements that will increase driver safety such as widening the roadway shoulders. The wider shoulders create opportunities for improved traffic flow during emergencies.

l. The Phase 2 modified plan adds four turning lanes at the Coopertown and Gator Park commercial sites, the Airboat Association, and the Miccosukee Osceola Camp. These dedicated turning lanes further improve driver safety.

m. The Phase 2 modified plan also adds a new access lane, barrier walls, and diagonal parking and wider shoulders at the Miccosukee Tigertail Camp, which creates safer roadway access and parking for the Camp's residents.

n. The reconstructed roadway in the Phase 2 modified plan will improve roadway stability throughout its 100-year lifespan, can better withstand high water events, and the impacts of climate change. The Phase 2 project ensures a higher quality of life for rural and tribal communities, by providing long-term reliable access to economically and culturally important sites.

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